

2

AN INTRODUCTION

TO THE

ORNITHOLOGY OF CUVIER,

FOR THE USE OF

STUDENTS AND TRAVELLERS.

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P R E F A C E.



THIS Manual is published with the same useful view which has been submitted in the Preface to the 'Analysis of the Natural Classification of Mammalia.'

The text is translated from Cuvier, arranged in a tabular form, illustrated by figures, and explained by notes comprehending the additional information which I have acquired during a patient study of the subject, preparatory to ^asecond travel in Africa.



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PLATE II.

FIG. I.

1. Intermaxillary.
2. Maxillary.
3. Lacrymal.
4. Palate.
5. Jugal.
6. Os quadratum.
7. Temporal.
8. Posterior frontal.
9. Frontal.
10. Parietal.
11. Occipital.

FIG. II.

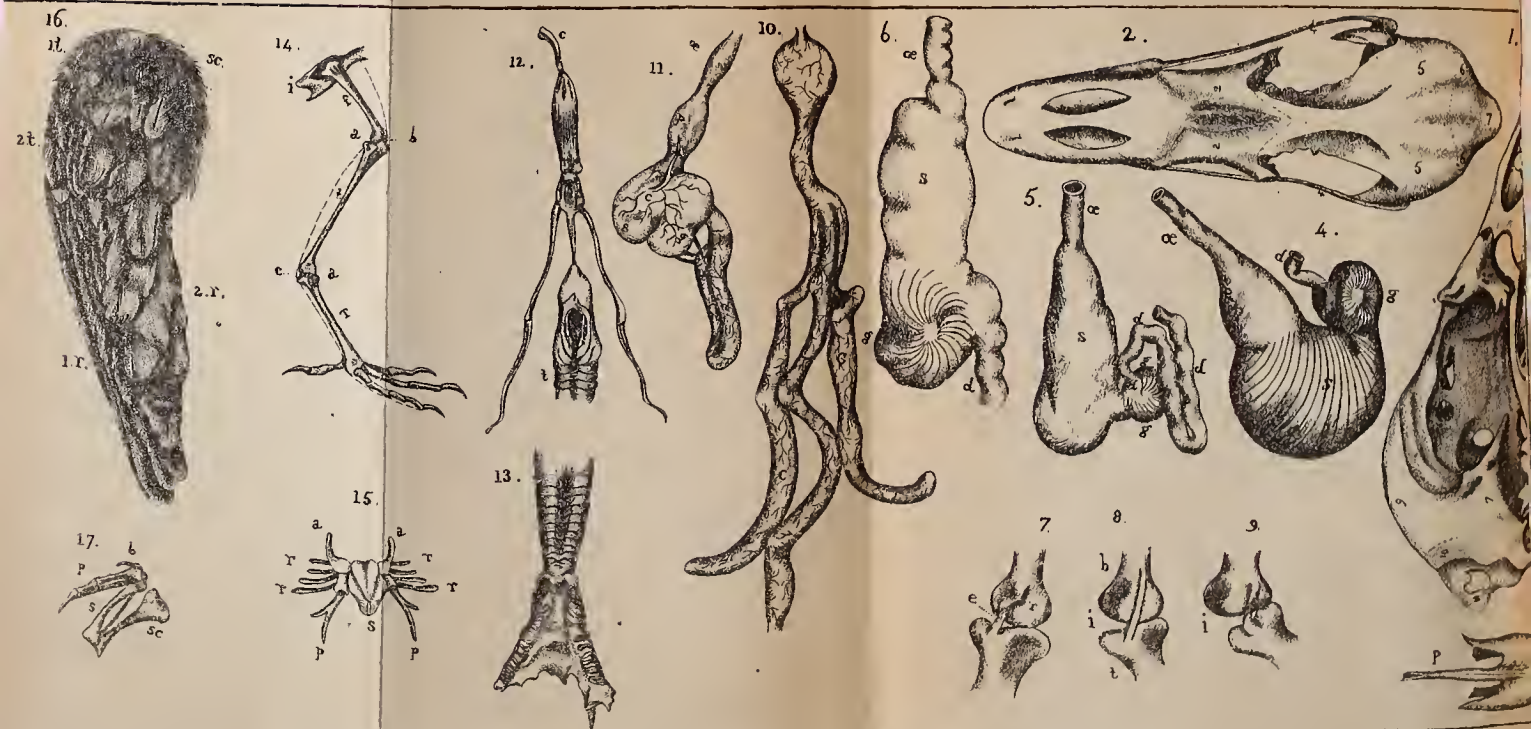
1. Intermaxillary.
2. Anterior frontal.
3. Ethmoidal.
4. Jugal.
5. Frontal.
6. Parietal.
7. Occipital.

FIG. XVI.

1. *t.* Tectrices minores.
2. *t.* Ditto majores.
1. *r.* Primaries or greater remiges.
2. *r.* Secondaries or lesser ditto.
- sc.* Tectrices scapularies.

FIG. XVII.

- sc.* The humerus on which the scapularies are attached.
- s.* The radius and ulna . . . secondaries . .
- b.* The thumb . . . bastards . .
- p.* The metacarpus and joints . . primaries . .



THE SECOND CLASS OF VERTEBRATED ANIMALS.

BIRDS

ARE vertebrated oviparous animals, with double respiration and circulation, organized for flight. Their lungs, not divided, fixed against the ribs, (1) are enveloped by a membrane pierced with large holes, which allow the air to pass into several cavities in the breast, the lower stomach, arm-pits, and even the interior of the bones; so that this fluid not only bathes the surface of the pulmonary vessels, but also that of an infinity of vessels in the rest of the body. (2) Thus, Birds breathe in certain respects by the branches of the aorta, as well as by those of their pulmonary artery; and the energy of their irritability is in proportion to the quantity of their respiration. Their whole body is so disposed as to partake of this energy. (3)

(1) The lungs of *Mammalia* are free and divided, and the diaphragm, which separates the cavity of their breast from that of their belly, does not exist in *Birds*.

(2) In *Mammalia* the inspired atmospheric air proceeds no further than the lungs, where it is immediately decomposed, the oxygen remaining to purify the blood which has been returned by the veins, and the nitrogen escaping, or (according to recent conclusions on this long contested point) entering into the body in very small portions: we know that nitrogen is found by chemists in all animal substances except fat (which when burned produces water and carbonic acid in the same proportions as vegetables); in plants, it is only found in the *Fungi* and in the perisperm of the *Gramineæ*. The atmospheric air not only performs its office in the lungs of Birds, but a portion of it proceeds to the aerian cavities (which are membranous bags, pervading even the substance of the beak and the skins of the feathers), insinuates itself between the muscles, and exercises the same salutary action on the blood contained in the vessels of these various parts of the body, as on that which has reached the lungs. The blood of *Birds*, from this greater proportion of oxygen, is of a much brighter red than that of *Mammalia*.

(3) The fact that two common Sparrows consume as much air as a Guinea Pig, demonstrates the greater capacity of the smaller frame of Birds, by means of the aerian cavities. Their system is consequently

Their anterior extremities, destined to support them in flight, cannot serve either for resting on or grasping; they are consequently biped, and take objects from the ground with their mouth: the body being necessarily inclined forwards beyond their feet, the thighs are in advance, and the toes are elongated to form a sufficient basis. The pelvis or basin is much extended in length, to furnish an adequate surface for the attachment of the muscles which support the body on the thighs. There is also a suite of muscles going from the basin to the toes, and passing over the knee and heel, so that the mere weight of the bird curves or contracts the toes; it is thus that they are enabled to sleep perched upon one foot. (1) The ischions, and especially the pubes, are prolonged backwards, and are placed wider apart, to leave the space necessary for the developement of the eggs. See Pl. 1.

The neck and beak are elongated to enable them to reach the earth, but the former has sufficient mobility to bend backwards when the bird is standing still; it has, therefore, many vertebræ: on the other hand, the trunk, which merely serves as a support to the wings, is necessarily moveable only in a small degree. The sternum (to which the muscles which lower or depress the wing to strike the air in flight are attached) is of a very great extent, and its surface is further augmented by a plate or *keel*, projecting

charged with more oxygen, which we know to be the powerful supporter of respiration, since a small animal, when confined in oxygen gas, lives thrice as long as another confined in the same bulk of common air. From imbibing a much greater proportion of this vivifying principle, Birds enjoy a much greater *irritability*; that is, their muscular force and digestive powers are greater, and all their efforts and actions are more energetic, instantaneous, and vigorous than those of larger animals whose construction does not afford these cavities. Irritability depends on respiration and circulation; sensibility on the brain and nerves. It is believed that the high temperature which the bodies of Birds attain, especially when sitting, and that extreme force which they employ in the act of flying, continued for several days, both depend on the action of the air on the blood.

(1) The course of these muscles from the ilium to the nails, is traced in the leg of a common Sparrow, fig. 14. It is evident, that when the angles $\alpha \alpha$ are lessened (on the femur, tibia, and tarsus, $f t T'$ becoming more nearly parallel to each other by the stooping of the bird on the perch), the tendons are strained to pass over the additional length created by the greater intervals, $b c$, between the joints, and the toes to which these tendons are fixed are cramped by the action. There is generally a distinct tendon passing to each point of the toes, and they unite above the knee. From the ilium to this point of union it is a muscular apparatus, but from thence it becomes tendon.

from the middle. It is formed of five pieces : a middle, of which this projecting plate is a part ; two anterior lateral for the attachment of the ribs ; and two exterior lateral for the extension of its surface. (1) The greater or lesser degree of ossification of the latter denotes more or less vigour for flight. The furcula, produced by the union of the two clavicles, and the two powerful supports or buttresses formed by the coracoid apophyses, (2) keep the shoulders widely apart ; the wing sustained by the humerus, by the fore arm, and by the hand (which is elongated, shewing one finger and the vestiges of two others), (3) bears a row of elastic pens along its whole length, considerably extending the surface which strikes or gives the shock to the air. The pens adhering to the hand are called *primary*, and there are always ten ; those which proceed from the fore arm are called *secondary*, their number varies ; the weaker feathers attached to the humerus are called *scapulary* ; the bone which represents the thumb has also some pens, called *bastards*. (4)

(1) These five pieces are only distinct in the young bird ; see the sternum of a fowl, fig. 15, from Geoffroy's Memoir in the 10th volume of the *Annales de Musée*, wherein he observes, that, in general, one half of the sternal ribs, *r r*, proceed from the anterior laterals, and the other half from the posterior laterals ; but it sometimes happens, that the greater number, or even the whole, are attached to the former : *a a* are the anterior laterals, *p p* the posterior ; *s* is the part corresponding to our sternum.

(2) See pl. 1. The *apophysis* is the base or round end of the bone, fitting into the opposite socket ; the *epiphysis* is a small bone articulated on the upper surface of the extremity of a large bone, as in the humerus of pl. 1 : the trace of these articulations remains distinct in *Mammalia* for six or seven years ; but in Birds they are obliterated very soon after birth, their more active life demanding and perfecting an earlier ossification of the *epiphysis*. We know that the bony matter is deposited by the blood of the arteries, whilst the calcareous is carried off by the lymphatic vessels ; consequently, as the circulation of *Birds* is much more rapid, from the stimulus of the greater proportion of oxygen, the bony matter is supplied and appropriated much more speedily than in *Mammalia*.

(3) In *Mammalia* it is always the middle finger which is rudimentary when the others are wanting ; hence it is concluded to be the middle finger which is the most perfect in the arm or wing of Birds ; see pl. 1, *fj*.

(4) See fig. 17, the bones of the wing of a common Sparrow ; also fig. 16. The primaries are also called the *greater remiges*, and the secondaries *the lesser* ; the lower scapularies are called the *tectrices majores*, the upper the *tectrices minores* ; the *tectrices scapulares* are situated at the lateral edge of the wing nearest the body

The bony tail is very short, but it also bears a row of strong pens, which, by spreading, contribute to the support of the bird; their number is generally twelve, sometimes fourteen, and, in the *Gallinaceæ*, even as many as eighteen.

The legs have a femur, a tibia, and a peronæum or fibula, connected with the femur by an elastic ligament, by means of which the extension is maintained without any effort on the part of the muscles. (1) The tarsus and metatarsus are represented by a single bone, terminating, towards the base, in three pulleys.

There are most frequently three toes in front, and a great toe behind; the latter is sometimes wanting. The great toe is directed forwards in the *Martins*. In the *Scansores* (*Climbers*) the last as well as the great toe is directed backwards. The number of articulations or joints increases at every toe, beginning with the great toe, which has two; and ending with the last toe, which has five. (2)

Birds are generally covered with feathers, the species of tegument best adapted to defend them from the rapid variations of

of the bird, and are particularly developed in the *Alauda* (Merops), hanging down between the body and the wing. The *bastards* form what is sometimes called the *alula*; they are strong feathers, or pens, situated in the upper end of the under surface of the wing, and very much developed in the Genus *Falco*. The *tectrices inferiores* are soft feathers between the bastards and the body. The feathers of the tail (which also has its *tectrices superiores* and *inferiores*) are called *rectrices*, from being compared to a helm.

(1) I have attempted to render this clear by the figures 7, 8 and 9. In fig. 7, the ligament is in the relaxed state in which it rests when the femur and tibia are nearly perpendicular, or at least form a very obtuse angle; *r* is a small rise or swelling in that part of the bone, in passing over which the ligament is compelled to strain or lengthen itself, as in fig. 8; directly it has passed this swelling, the strain ceases, and it instantly contracts, resuming the same state as at first, but on the contrary side of the swelling, as in fig. 9. Thus the peculiar jirk in the walk of Birds, particularly in the *Grallæ*, is explained; the exertion of the muscles raises the leg and foot from the ground, until the femur and tibia form the angle which strains the ligament to the utmost, as in fig. 8; and the sudden contraction of this ligament spontaneously raises the foot with a catch or jerk, as much higher from the ground as the gait of the bird requires; in setting the foot to the ground in order to raise the other, the muscles are again called upon to act, until the ligament has resumed the position of fig. 8, its subsequent and sudden release and contraction replacing the foot on the ground as at first.

(2) This is also the case with *Reptiles*; in *Mammalia* there are always an equal number of joints to each toe.

temperature to which their movements expose them. The aerian cavities which occupy the interior of their body, and even the place of the marrow in the bones, diminish their specific gravity. (1) The sternal portion of the ribs is ossified like the vertebral, in order to give more force to the dilatation of the breast. (2)

The eye of Birds is disposed so as to distinguish near and distant objects equally well. A vascular folded membrane, which proceeds from the bottom of the globe to the edge of the chrystalline, probably contributes to this property, by displacing the lentil. The anterior face of the globe is strengthened by a circle composed of bony pieces; and besides the two ordinary eye-lids, there is always a third placed in the inner angle, which, by means of a curious muscular apparel, can cover the front of the eye like a curtain. (3) The cornea is very convex, but the chrystalline is flat, and the vitrea small.

The ear of Birds has but one bone between the tympanum and the fenestra ovalis; (4) their helix is a cone, scarcely arched; but their semi-circular canals are large, and lodged in a part of the skull, where they are environed on all sides by aerian cavities, which communicate with the os quadratum. The nocturnal birds alone have a large exterior conch, which, however, does not project like that of quadrupeds; it is generally covered with feathers with finer beards than the others. (5)

The organ of smell, hid in the base of the beak, has generally

(1) The purpose of this organisation, however, is not well understood; it is not to aid their flight, as we might at first suppose, since the *Ostrich* and the *Casuar* are full of these aerian cavities, and yet scarcely fly at all; whilst the Genera *Larus* and *Anus*, (with the exception of the common Duck) and Birds which hunt on the surface of waters, whose frames are comparatively deficient in these cavities, (fig. 15, *rr*) and whose bones are full of marrow instead of air, fly exceedingly well.

(2) It will be recollected that this part of the ribs is only cartilaginous in *Mammalia*.

(3) This, which is called the nictitating membrane, being translucent, defends the eye of the bird when flying in face of the sun, without obstructing the sight. It is for the same purpose, in fact, as the coloured glass in our instruments for observing the sun. It also protects the eye of the Diving Birds, when under water.

(4) In *Mammalia* there are three, and they are articulated angularly.

(5) We must lay back the feathers with our fingers to discover the conch, which is a thin leathery piece of flesh, in shape not unlike our own; but the orifice of the ear is behind instead of before it.

only cartilaginous cornea, three in number, which vary in complication; it is very sensible, although it has not any sinus hollowed out in the thickness of the skull. (1) The width of the bony openings of the nostrils determines the form of the beak; and the cartilages, the membranes, the feathers, and other teguments which narrow these openings, influence the strength of smell, and the kind of nourishment.

The tongue has but little muscular substance, and is sustained by a prolongation of the *os hyoidis*. (2)

The feathers as well as the pens, for they only differ in size, are composed of a stem (hollow at its base), and beards, which bear others still smaller; their texture, their brilliance, their strength, their general form, varies to infinity. The touch must be weak in all the parts which are covered with feathers; and as the beak is almost always horny, and not very sensible, and the toes are covered with scales above and a callous skin below, this sense must be of very little efficacy in birds.

The feathers fall twice every year. In certain species, the winter plumage differs from that of the summer; in the greater number, the female differs from the male by less lively colours, and then the young ones of both sexes resemble the female. When male and female adults are of the same colour, the young ones have a plumage peculiar to themselves.

(1) In *Mammalia*, these sinuses (which are distinguished from simple cavities by having a channel of communication with the seat of some organ) are covered, as well as the cornea, with a soft membrane, upon which the branches of the olfactory nerves are distributed: their surface (against which the volatile particles of the effluvia of bodies strike after passing through the nose) is thus much more developed or spread, and consequently more susceptible. The tracing of the olfactory nerves to the palate, by Jacobson, satisfactorily accounts for the intimate sympathy between taste and smell. The projection of forehead in the Owl and the Elephant, which induced the ancients to attribute superior wisdom to them, is caused by the large cells between the interior and exterior surfaces of the frontal bone. In the Elephant they communicate with the nostrils, and are therefore true sinuses, which probably strengthen the sense of smelling; but in the Owl they are simple insulated cavities.

(2) See fig. 12, wherein *c* is the cartilaginous prolongation of the *os hyoidis*, and *t* the upper part of the *trachea*, the orifice of which is closed at the pleasure of the animal. Dumeril observes, that the organ of taste scarcely exists in Birds; that, in general, they have no saliva, and swallow their food without mastication. There are some, however, Parrots and Ducks, for instance, which appear to taste their food, and also possess the organs for furnishing saliva.

The brain of Birds has the same general characters as that of other oviparous vertebrated animals, but it is distinguished by a very considerable proportionate size, which often even surpasses that of the same organ in *Mammalia*. Its volume consists principally of tubercles, analogous to the “*cannelés*,” and not in the hemispheres, which are very thin, and without circumvolutions. (1) The cerebellum is tolerably large, almost without lateral lobes, and almost entirely formed by the vermiform process.

The *trachea* of Birds has its rings entire; at its bifurcation is a glottis, generally provided with distinct muscles, and called the *inferior larynx*; it is there that the voice of birds is formed; the enormous volume of air contained in the aerian cavities contributes to the strength, and the *trachea*, by its various forms and movements, to the modifications of the voice. (2) The *superior larynx* is very simple, and does not avail much.

The face or superior beak of Birds, formed principally by their *intermaxillaries*, is prolonged behind in two arcades; the internal

(1) This is the *corpus rectiforme*, which makes a part of the cerebellum in Birds; there is no middle lobe, which disappears in all the *Mammalia* below *Apes*. Sensibility is considered to depend on the proportion of brain and nerve: in our common Ducks and Fowls, the brain is not more than 1-300th part of the size of the whole body, whilst in Swallows, Parrots, Canaries, and others, it amounts to 1-14th part. Thus, the former, in whom a much smaller proportion of nerve is developed, are unequal to the art of making nests; whilst the latter display much ingenuity in the fabric, know where to find them again after a long absence, whistle and sing in their dreams, and display their superior sensibility in a variety of ways. We know that Swallows frequently fall to the ground in fits from their extreme sensibility.

(2) See fig. 13, wherein *g* is the *glottis*, which is of a horny substance. In *Mammalia* the bifurcation takes place without the intervention of a *glottis*. The inferior larynx is enlarged variously (sometimes into two large lobes) according to the nature of the voice of the bird. The circles which are continued all round in *Birds*, extend only half round the tracheæ of *Mammalia*. In the latter the voice is formed in the upper part of the trachea; in the former, in the lower or distinct part of which we have been speaking, and which has a small apparatus within, precisely similar to the mouth of a clarionet; whilst in *Mammalia* the trachea contains two chords only, which vibrate whenever we choose to pass a current of air through them, and thus produce the voice. This may be demonstrated in a degree by blowing gently through the tracheæ of *Mammalia* and *Birds*, even after dissection. Referring to this, M. Cuvier, in his Comparative Anatomy, has happily compared the trachea of *Birds* to a wind, and that of *Mammalia* to a stringed instrument.

of which is composed of the bones of the *palate*, and the external of the *maxillaries* and the *jugals*, both of which rest upon a flexible tympanic bone, vulgarly called the square bone; (1) this same face or front is articulated or united to the skull above by elastic plates; a mode of union which always leaves some mobility. (2)

The horn which covers the two mandibles supplies the place of teeth, and is sometimes prickled in such a manner as to represent them; its form, as well as that of the mandibles which support it, varies to infinity, according to the kind of food to which each species is accustomed.

The digestion of Birds is in proportion to the activity of their life and the strength of their respiration. The stomach is composed of three parts: the *crop*, which is an enlargement of the *œsophagus*; the *succenturium*, a membranous stomach, furnished within its cells by a multitude of glands, the juice of which is imbibed by the aliments; and the *gizzard*, armed with two vigorous muscles, united by two tendons, radiated and covered withinside by a velvet-like cartilage. (3) The aliments are ground there, and the more easily in proportion as the Birds take the precaution to

(1) In *Mammalia* the *os quadratum* (see fig. 1, pl. 2) makes but one with the *temporal*; Geoffroy first shewed that it was distinct in the 2d, 3d, and 4th Classes of Vertebrated animals. In the Genus *Testudo* of the 3d, it appears scarcely separated, as if in the act of *quitting* the *temporal*.

(2) See the skull of a Duck, figs. 1 and 2: the *maxillary* ceases at the small rising which indicates its articulation with the *jugal*. The upper mandible being united to the skull by an elastic plate (*p.* fig. 3.) like a very thin slip of whalebone, has the power of raising itself towards the forehead; a motion impossible to the upper jaws of *Mammalia*.

(3) Fig. 11 was drawn from a preparation of the inside of a common fowl; *æ* is the *œsophagus*; *s* the *succenturium*, and *g* the *gizzard*, which communicates internally at *c*; *d* is the *duodenum* or the first 12 inches of the intestines. The crop, or *prolobus* (*p.*), is represented empty; when full, it swells out like that of the Vulture, fig. 29. Fig. 6 is the stomach of the Heron; fig. 5 of the *Procellaria Pelagica*; fig. 4 of the Ostrich: the *crop* is wanting in each, but the *succenturium* is considerably developed. In the Heron it is confounded with the *gizzard*, which, however, is easily distinguished by its muscular fibres. In the *Procellaria*, the *succenturium* is very distinct from the *gizzard* or third stomach. In the Ostrich, the stomach seems divided into two parts; the upper and smaller of the two is more glandulous than the other. The grain or aliment remains long enough in the crop to be mollified by the heat and the humour (analogous to the saliva) which is discharged from its cells; so that, in fact, their food is chewed there,

swallow small stones, to augment the trituration. (2) In the greater number of species which only live on flesh or fish, the muscles and the lining of the gizzard are reduced to an extreme weakness, and it seems to form but a single bag with the succenturium. (3) The dilatation of the crop is also sometimes wanting. (4)

The liver pours the bile into the intestines by two conduits, which alternate with the two or three by which the pancreatic liquor passes. (5) The pancreas of Birds is considerable, but their spleen is small; they want the epiploön, the uses of which are partly supplied by the cells of the aerian cavities; (6) two blind appendices are placed towards the origin of the rectum, and at a little distance from the anus; they are more or less long, according to the diet of the bird. (7) The *Hérons* have but one, which is short; other genera, as the *Pici*, want them entirely.

instead of in the mouth, which is not furnished with salivary glands like ours.

(2) The digestion of Birds is thus assisted by a mechanical in addition to the chemical power.

(3) The most striking proof that it is much more laborious to digest vegetables than flesh, is, that the intestines of the cat, which eats nothing but flesh in its wild state, become one-third longer in the domestic state, when they so frequently eat vegetables and bread: they are known to be the same species.

(4) The *Anas* and the *Insectivores* of Temminck (the *Ant Eaters*, the *Motacillæ* of Lin. *Cincli*, etc.) also want the crop or *prolobus*. When the crop, or even the succenturium, is wanting, as in the *Aquilæ*, the Bird is supplied either with very long intestines or very long cæcums, and the upper part of the gizzard or stomach is generally armed with numerous extra glands, the juices from which compensate in a degree for the absence of the other aids of digestion. This muscular stomach or gizzard of Birds is said to be more fleshy in proportion as the animal possesses a weaker beak, or as its nourishment is more solid. On quitting this stomach, the aliments, reduced to a sort of pap or chyme, pass through the rest of the intestinal canal, wherein the most nutritive parts are absorbed for the support or repair of the body; the rest being ejected by the cloaca. Vauquelin discovered twice the quantity of phosphate of lime in the excrements of Birds, which he found in the grains forming their exclusive nourishment.

(5) The secretion of the pancreas is to moderate or soften the strength of the bile.

(6) The epiploön is a sort of web, enveloping the intestines of *Mammalia*, to support them in their place, and the injury of which is the cause of hernia or rupture.

(7) The use of the *cæcum* is not known; see fig. 10, *c c*, those of the common fowl; this Bird is provided with long cæcums as well as the

The cloaca is a pocket, in which the rectum, the ureters, and the spermatic canals, or, in the female, the oviductuses, (1) terminate; its exterior opening is the anus. (2) In general, Birds do not discharge their urine, but it mixes with the solid excrements. The Ostriches, alone, have the cloaca sufficiently dilated for the urine to accumulate there.

In the greater number of genera, copulation takes place by the juxta-position of the anus; the Ostriches and several Palmipedes, however, have a penis, with a deep furrow on the outer surface, by which the seed is conducted. The testicles are situated in the interior, above the kidneys, and near the lungs; there is but one ovary and one oviductus.

The egg detached from the ovary, where the yolk only is perceptible, imbibes the exterior liquor, called the *white*, in the upper part of the oviductus, and is furnished with its shell in the lower part of the canal; the young one is developed by incubation, unless the heat of the climate is sufficient, as it is with Ostriches. It has a horny tip at the end of its beak, which enables it to cleave the egg, and which falls off a few days after birth. (3)

three stomachs, since it feeds almost entirely on grain, which is one of the most difficult aliments to digest.

(1) In the winter season the *oviductuses* of Birds are scarcely distinguishable, on dissection; but in the spring they are very evidently developed, and the end nearest the *ovary* enlarges considerably, and environs it, to receive the falling eggs.

(2) In *Mammalia*, the *rectum* is continued to the *anus*, the *ureters* pass from the kidneys into the bladder, and both these channels and apertures are distinct; in Birds the *anus* is the inferior opening of a large bag, called *cloaca*, from its being a reservoir for the *fæces* as well as the secretions, and into which the *rectum*, the *ureters*, the *spermatic ducts*, and the *bursa fabricii* discharge their contents. The use of the secretion discharged into the cloaca by the *bursa fabricii*; which does not exist in *Mammalia*, is considered by some Naturalists to be that of colouring the yolk of the egg.

(3) Eggs require a heat of nearly 54° of Farenheit to enable the germ to develope itself. Almost all Birds sit and fast during the incubation: they feel a sort of fever produced by maternal love, which sometimes elevates their temperature as high as 79°. We first observe the germ besprinkled with red spots (which we soon recognise to be blood vessels) towards the centre, where we next perceive the heart in motion; we afterwards begin to distinguish the head, with two large eyes; the beak, the wings, and the claws are then developed; but all these parts are in a state of considerable softness. The albuminous matter is absorbed in proportion to the developement of the foetus. The yolk does not appear to diminish in size, and it is only at the mo-

Every one knows the varied industry which Birds exercise in the construction of their nests, and the tender care which they take of their eggs and their young ones; it is the principal part of their instinct. Their rapid passage through the different regions of the atmosphere, and the lively and constant action of this element upon them, afford the means of presaging variations of the atmosphere of which we have no idea; which circumstance has, from the earliest times, induced superstition to attribute to Birds the power of announcing the future; (1) neither do they want memory, or even imagination, for they dream; and every one knows with what facility they are tamed, allow themselves to be trained to different services, and retain airs and words.

Division of the Class of Birds into Orders.

Of all the Classes of Animals that of Birds is the most marked, that in which species most resemble each other, and which is separated from all others by the greatest interval; its subdivision is consequently more difficult.

Their distribution is founded, like that of Mammalia, on the organs of manducation, or the beak; and on those of prehension, that is to say, the beak, and, especially, the feet.

We are first struck with the palmated feet, or those of which the toes are united by membranes, which distinguish all the swimming birds. The backward position of these feet; the length of the sternum, the neck often longer than the legs (to reach the deeper places), the close smooth plumage (impervious to water), contribute to make the Palmipedes good navigators.

In the other Birds which have, generally, some little web, at least between the external toes, we observe elevated tarsi; thighs naked of feathers towards the lower part; a slender shape; in a word, all the construction proper for fording or walking along the edges of waters, to search for food. Such in fact is the diet of the greater number, and, although some live on dry land, they are called Shore Birds or Grallæ.

ment when the bird is ready to be hatched, that this humour disappears, entering by the naval into the belly of the young bird. The yolk is supposed to be absorbed in the interior of the body, as it passes into the intestines, and may be considered as a sort of milk or first nourishment.

(1) The Palmipedes and Grallæ, for instance, always come to land when they foresee a storm; the Procellariæ, more especially, amongst the former, and the Fulicæ amongst the latter.

Amongst the true Land Birds, the Gallinaceæ have, like our domestic cock, a heavy appearance ; short flight ; a middle-sized beak, the upper mandible vaulted ; the nostrils, partly covered with a soft swelled scale ; and, almost always, the toes dentated at the edges, and short membranes between those in front. They live principally on grains.

Birds of Prey have the beak crook'd, with a sharp point, and curved towards the base, which is entirely covered by a membrane wherein the nostrils are pierced ; their feet are armed with strong nails. They live on flesh, and pursue other Birds : most of them, therefore, have a powerful flight. The greater number have a small web between the external toes.

The *Passeres* comprehend many more species than all the other Families, but their organisation offers so much analogy that we cannot separate them, though they differ very much in size and strength. Their two external toes are united at their bases, and sometimes in a part of their length.

Lastly, we have given the name of *Climbers* to the Birds whose external toe is turned behind like the great toe, because the greater number employ a construction so favourable to the vertical position, in climbing the trunks of trees.

Each of these orders is subdivided into Families and Genera, principally according to the formation of the beak.

SECOND CLASS OF VERTEBRATED ANIMALS.

ORDERS.

1. ACCIPITRES, *Lin.*

Beak crook'd. Fig. 18. Talons crook'd ; 3
Nostrils inserted in a toes before, 1 behind.
cera. Fig. 18. A short membrane,
generally, between the
two external toes. Fig.
19.

2. PASSERES.

All such as cannot be
classed in the other five
orders.

Birds

Orders

Kind Toes

2 & 2 before

1, or none: those before

entirely free: bent & nails crook'd

entirely by broad membranes

united

partly

all, at the base

the 2, exterior: tarsi

3 SCANSORES

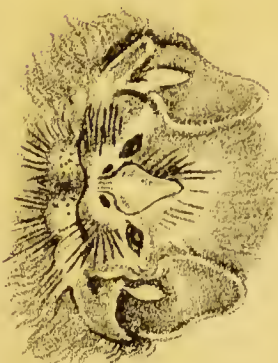
1 ACCIPITRES

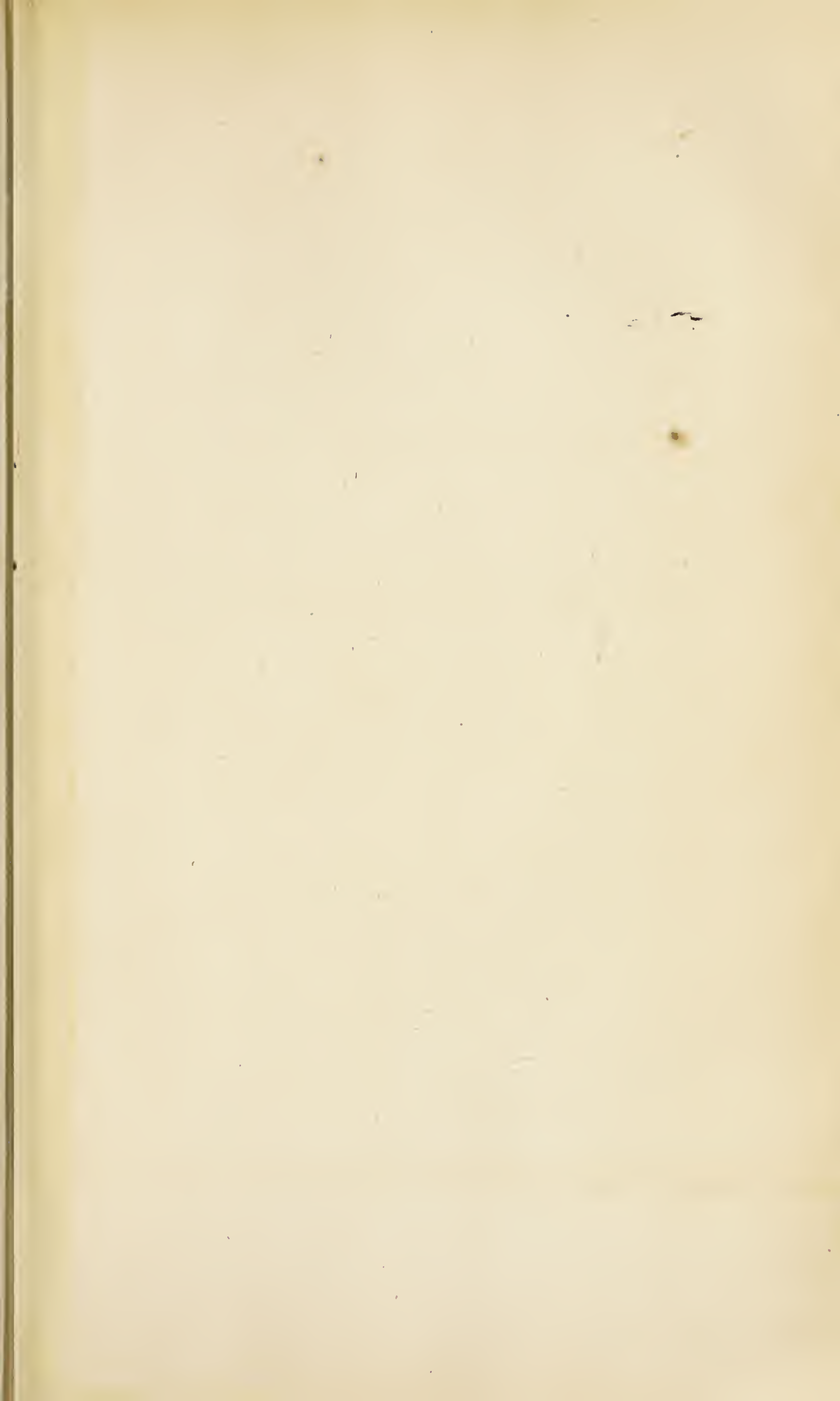
6 PALMIPEDES

4 GALLINACEE

very long: the thighs partly naked 5 GRALLAE

moderate: the thighs feather'd: 2 PASSERES







3. SCANSORES, *Illiger.*
GRIMPEURS, *Cuvier.*

The external toe
turned behind with
the great toe. Fig. 20.

4. GALLINACEÆ, *Lin.*

The upper jaw or mandible vaulted. Fig. 22. The nostrils placed in a large membranous space from the base of the beak, and covered by a cartilaginous scale. Fig. 21.

The anterior toes united at their base by a short membrane, dentated along the edge. Fig. 23.

5. GRALLÆ, *Lin.* ECHAS-
SIERS, *Cuv.*

Naked thighs. Fig.
24.

6. PALMIPEDES.

The only birds whose neck exceeds the length of their legs.

Palmated feet, for running, on short compressed tarsi, fixed in the hinder part of the body. Fig. 25.

Plumage imbued with an oily juice; skin furnished with a thick down.

Birds of Prey (*Accipitres*, *Lin.*) are distinguished or recognised by their crook'd beak and nails; powerful weapons, with which they pursue other Birds, and even the weaker Quadrupeds and Reptiles. They are the same, amongst Birds, as the *Carnivora* amongst Quadrupeds. The muscles of their legs and thighs indicate the force of their talons; their tarsi are rarely elongated. They all have four toes and the nails of the great and middle toes are the strongest.

LINNÆUS'S
DIVISION OF THE ORDER
ACCIPITRES
INTO
GENERA.

- | | |
|------------|--|
| 1. VULTUR. | Rostrum rectum apice aduncum.
Caput impenne antice nuda cute.
Lingua bifida.
Collum retractile. |
| 2. FALCO. | Rostrum aduncum basi cera instructum. (1)
Caput pennis arcte tectum.
Lingua bifida. |
| 3. STRIX. | Rostrum aduncum (absque cera). (2)
Nares oblongæ, pennis setaceis recumbentibus
obtectæ.
Caput grande auribus oculisque magnis.
Lingua bifida. |
| 4. LANIUS. | Rostrum rectiusculum dente utrinque versus
apicem basi nudum.
Lingua lacera. |

Latham divides the Order *Accipitres* simply into Genera, as Linnæus has done, but he has removed the Genus *Lanius* to the succeeding Order, like Cuvier; whilst Bechstein, Temminck, and others, retain it in the present.

(1) Latham also retains this as a distinct character of the Genus *Falco*, whereas it is evidently common to the Genus *Vultur* also.

(2) The *cera* exists in this Genus, covered wholly, or in part, with stiff hairs. Latham subdivides this Genus into *auriculatæ* and *inauriculatæ*; the other Genera present no subdivisions, and thus the traveller, for it may be no inconvenience to the Ornithologist, is perhaps obliged to search through 41 closely printed 4to. pages to find a species of *Falco*. The admirable sagacity and laborious observation of Linnæus, although he founded his system on the exterior of animals, led him to foresee many of the peculiarities of their interior construction, which the science of Cuvier has demonstrated as the bases of a *natural* system, and most of the *Genera* of the former will be recognised in the *Families* of the latter.

ORDER I. ACCIPITRES.

FAMILIES.

1. DIURNÆ.

Nostrils inserted in a . . . 3 toes before ; 1 be- . . . Eyes directed side-
 naked cera. Fig. 18. . . hind without feathers. . . ways.

2. NOCTURNÆ.

Nostrils pierced at . . . External toe turned . . . Large eyes directed
 the anterior edge of a . . . behind at pleasure. . . frontways.
 cera, covered more or
 less with stiff hairs. p.27.

The *Diurnæ* have their eyes directed sideways ; a membrane called cera covering the base of the beak, in which the nostrils are pierced ; three toes before, one behind without feathers ; the two external toes almost always united at their base by a short membrane ; their plumage close ; their pens strong ; their flight powerful ; their stomach almost entirely membranous ; their intestines little extended ; their cæcum very short ; their sternum large and completely ossified, to afford a more extended surface for the attachment of the muscles of the wing ; and their furcula semi-circular, and very much widened, the better to resist the violent depressions of the humeri, necessary to a rapid flight. Linnæus made but two Genera of them, which are two natural divisions, the Vultures and the Falcons. (1)

The *Nocturnæ* have a large head, very large eyes, directed forwards, encircled by a ring of fine feathers, the anterior of

(1) I extract the following addenda from M. Temminck's description of this order, in his *Manuel d'Ornithologie*, after Bechstein, Meyer, and his own superb collection, universally allowed to be the first in Europe.

“ Beak compressed ; nostrils open ; toes rough underneath ; nails pointed. These birds live in monogamy ; they nest on inaccessible rocks, or very high trees ; the number of their eggs never exceeds six. Their food consists entirely of living, or very rarely of dead prey, which they swallow in pieces enveloped in the hairs or feathers, these substances, as well as the bones, forming a ball in the stomach, and being rejected by the mouth ; they eat copiously when an opportunity presents itself, but they can fast several days ; the blood of their victims is sufficient to quench their thirst. The female is generally a third larger in size than the male.” Dameril observes that the male birds of this Order never sit on the eggs, but nourish the female while she does so.

which cover the membrane of the beak, and the posterior the opening of the ear. Their enormous pupil admits so many rays, that they are dazzled by the full day. Their skull thick, but of a slight substance, has large cavities which communicate with the ear, and probably strengthen their sense of hearing; but their flying apparatus does not possess great force. Their furcula can resist but little. Their feathers, with soft beards and fine down, do not make the least noise when flying. Their external toe may be directed, at pleasure, before or behind. These Birds generally fly during the twilight and moonlight. When they are attacked by day, or struck by some new object, they do not fly away, but erect themselves, assume strange postures, and make ridiculous gestures. Their gizzard is tolerably muscular, although their prey is entirely animal, consisting of mice, small birds, and insects, but it is preceded by a large crop; their cæcums are long and enlarged at the end. Small birds have a natural antipathy to them, and assemble from all parts to attack them, for which reason they are employed to attract birds into snares.

FAMILY I. DIURNÆ.

GENERA.

1. VULTUR, *Lin.* VULTURE.

Beak elongated, curved towards the end.

Eyes even with the head. p. 18.

Part of the head or neck bare.

Wings so long that they hold them half extended when walking.

2. GRIFFON. GYPAETOS, *Storr.* PHÈNE, *Savigny.*

Nostrils covered with stiff hairs, directed forwards, and a brush of the same under the beak. Fig. 31.

Head and neck entirely covered with feathers.

3. FALCO, *Lin.* FALCON.

Projecting eyebrows, making the eyes appear sunk, and giving them a physiognomy entirely different to that of the other Genera. Fig. 32. p. 19.



Vultures have their eyes even with their heads; their tarsi reticulated, that is to say, covered with little roundish scales (fig. 19); the beak long, curved only at the end; a greater or lesser part of the head, or even of the neck, naked of feathers. The strength of their talons is not proportionate to their size, and they make more use of their beak. Their wings are so long, that they hold them half extended when walking. They are cowardly birds, and feed on carrion oftener than on living prey; after they have eaten, their crop forms a large projection above their furcula (fig. 29); a fœtid humour runs from their nostrils, and they are almost reduced to a state of stupidity. (1)

The *Griffons*, placed by Gmelin in the Genus *Falco*, approach near to the *Vultures* by their manners and conformation. Their eyes are even with their head; their talons are proportionably weak; the wings are half spread during the time of repose; their crop, when full, projects from the base of the neck, but their head is entirely covered with feathers; their distinguishing character consists in a very strong beak, straight, crook'd at the end, swelled at the crook; and in nostrils covered with stiff bristles directed forwards, and a brush of similar bristles under the beak; their tarsi are very short, and feathered as far as the toes; their wings very long, and the third pen feather the longest. (2)

The only species of *Griffon* yet known is the *V. Barbarus* (Bearded Vulture, Vulturine Eagle, *Lath.*) the largest of all Birds of Prey in the Old World. Fig. 31.

Falcons form by far the most numerous Division of the *Diurnal*

(1) The inferior mandible straight, rounded, and inclined towards the point; mouth terminating in advance of the eyes; head naked, or covered with a very short down; wings sensibly rounded; the first remex short, not equalling the sixth; their second and third less long than the fourth, which is the longest. Their flight, although slow, allows them to rise to a prodigious height; their ascent is managed by winding, and their descent in the same way; their sight is piercing; the organ of smelling singularly perfect; their attitude embarrassed, and their gait heavy: they live in troops, and feed solely on carrion; They nest on the most inaccessible rocks, carry the nourishment for their young in their crops, and vomit it before them. — *Tem.*

Their nests are composed of branches and small slips of wood. — *Dumeril.*

(2) Head small; nostrils oval; feet short; four toes, the three front united by a short membrane, the middle toe very long. Nails slightly crook'd; the first remex of the wing a little shorter than the second. They live in pairs, constantly feed on living prey, which they eat on the spot without taking any away in their talons. — *Tem.*

GENUS I. VULTUR.

(1) Beak crook'd; the inferior mandible obliquely rounded, and, sometimes, both sloped. Nostrils lateral, rounded, open. Tarsi covered with feathers, or smooth and covered with scales. Nails sharp, very much crook'd. Wings with strong stems.—*Tem.*

Sarcoramphus.—America produces some Vultures remarkable for the carunculæ surmounting the membrane at the base of their beak, which is large as in the preceding, but the nostrils are oval or longitudinal. These are the *Sarcoramphi* of Dumeril. *Vultur Papa*, Lin. (*King of the Vultures*, Latham) fig. 28. *Vultur Gryphus* (*Great Vulture of the Andes*), fig. 30, which habitually prefers an elevation at which the mercury of the barometer sinks to about sixteen inches. (1)

The *Percnopteri* have the beak thin, long, and swelled above. Its head only, and not the neck, naked of feathers. These are birds of a moderate size, and their force does not approach that of the Vultures properly so called. They are therefore much more eager after carrion and all sorts of offal, which attracts them from a great distance. They do not even refuse excrements. *Vultur Percnop.* (*Egyptian Vulture*, *Alpine Vulture*, Latham), fig. 27. *Vultur Aura* (*Turkey Buzzard*, Latham).

GENUS III. FALCO.

SUB-GENERA.

1. NOBILES.

A sharp tooth at each side of the point of the beak. Fig. 35.	Second feather of the wing the longest. Wings as long and longer than the tail.
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2. HIERO-FALCO, Cuv.

A festoon, instead of a tooth, on each side of the point of the beak. Fig. 33.	Tail longer than the wing, which is the same as that of the <i>Nobiles</i> .
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3. IGNOBILES.

A slight festoon in the middle of the beak. Fig. 34.	Fourth feather of the wing the longest. p. 21.
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(1) I expect that the Vulture of Ashantee will form a subdivision in the *Sarcoramphi*, which have hitherto only been found in America. Its cera is crowned with a caruncula, which, when the bird is flying, is small, but when it is seeking food, is so much elongated as to hang over the tip of the beak; when in the act of feeding, or when satiated, it hangs on one side to the length of two inches. This caruncula, and the skin of the head and neck, is wrinkled like that of a Turkey, and generally of a deep red, but sometimes of a pale livid blue. The plumage is dark brown, and it performs the same offices as the *Percnopterus*.

The *Nobiles*, or Falcons properly so called, are the most courageous in proportion to their size, a quality which proceeds from the strength of their beak, talons, and wings. Their beak, curved from its base, has a sharp tooth on each side of its point; and the second pen feather of their wings is the longest, the first being also nearly as long, which renders the entire wing longer, and more pointed. Some peculiar habits result from this. The length of the pen feathers weakens their vertical effort, and renders their flight in a calm atmosphere very oblique forwards, which obliges them, when they wish to rise in a straight line, to fly against the wind. These are the most docile of all birds, and the most serviceable in the art of falconry; being taught to pursue the game, and to return when called. They all have their wings as long or longer than the tail. (1)

Falco Communis, Gm. (the Common Falcon, Yearling Falcon, Haggard Falcon, *Lath.*)—*Falco Subbuteo*, (Hobby Falcon, *Lath.*) etc. etc.

The *Sacred Falcons* have the pen feathers of the wings as in other *Noble Birds*, all of whose inclinations they also evince; but their beak has only a festoon, like that of the *Ignobiles*. Their tail, long and spread, evidently surpasses their wings, although the latter are very long. Their short and reticulated tarsi are covered with feathers one third of their length. *Falco Candidans*, (Speckled Partridge Hawk, *Lath.*)

The *Ignobiles* (so called because they cannot well be employed in falconry,) are a more numerous tribe than that of the *Nobiles*, and more necessary to subdivide. The longest pen feather of their wings is almost always the fourth, and the first is very short, which produces the same effect as if their wing had been obliquely chopped off at the end, whence a weaker flight ensues. In all other respects they are equal, except that their beak is not so well armed, because there is no lateral tooth near its point, but only a slight festoon in the middle of the length.

(1) Beak strong; very short; inferior mandible sloped; nostrils wide; feet strong; toes strong, armed with curved and sharp nails; the first remex of the wing short, of equal length with the third, the second the longest. They nourish themselves with living prey, without ever feeding upon dead, and shew much address either in seizing or surprising it: they pursue birds at full speed, or fall perpendicularly upon them; and like to nest in rocks or in ruins of houses.—*Tem.*

SUB-GENUS III. IGNOBILES.

TRIBES.

1. AQUILA, *Briss.* EAGLES.

Beak very strong, straight at its base, curved only towards the point. Fig. 32. p. 24.

2. ASTUR, *Bechstein.*
DÆDALION, *Savigny.*
AUTOURS, *Cuv.*

Beak curved from the base. p. 26.

Wings shorter than the tail.

3. MILVUS, *Bechstein.*
KITE.

Tarsi short, toes and nails feeble.

Wings excessively long.

Tail forked.

Beak curved from the base, but disproportionately feeble. Fig. 36. p. 26.

4. PERNIS, *Cuv.*

Beak as *Milvus*.

Interval between the eye and beak covered with close scaly feathers; and not naked or merely hairy as in all the others of the Genus *Falco*.

Tarsi half covered with feathers, reticulated.

Wings long, but tail not forked.

5. BUTEO, *Bechstein.*
BUZZARDS, *Lath.*

Interval between the eye and beak naked.

Wings at least as long as the tail.

Tail even.

6. CIRCUS, *Bechstein.*

A collar on each side of the neck, formed by the ends of the feathers covering the neck. Fig. 34.

Tarsi longer than in the tribe *Buteo*; the wings the same.

Tail even.

7. SERPENTARIUS, Cuv.

GYPOGERANUS, Illiger.

Beak cleft; eye-brows projecting; orbit of the eye naked of feathers. Fig. 37.

The only Birds of this Order with the tarsi exceedingly long; plated. Fig. 38. Toes short in proportion.

A long stiff *crista* from the occiput. The two middle feathers of the tail considerably surpass the others.

Eagles, which form the first tribe, have a very strong beak, straight at the base, and only curved towards the point. It is amongst these that we find the largest species and the most powerful of all Birds of Prey. (1)

The *Astur* tribe, which forms the second division of Ignobiles, have, like the two last divisions of Eagles, wings shorter than the tail; but their beak curves from its base, as in all those which follow. (2)

Kites have the tarsi short, the toes and nails weak, which, added to a beak equally disproportionate to their size, makes this tribe the most cowardly of the whole Genus; but they are distinguished by their excessively long wings, and by their forked tail, which gives them a most rapid and easy flight. Some have the tarsi very short, reticulated, and half covered with feathers. (3)

(1) Head flattened on the top, covered with elongated feathers. Beak very much crook'd, a long and very sharp point. Nostrils lateral, transverse, sloped; feet strong, armed with powerful nails, very much crook'd. Wings long, the first, second and third remiges the shortest; the first very short, the fourth and fifth the longest. They seize living prey with their talons, and take it to their young; when pressed with hunger they fall upon carrion.—*Tem.*

(2) Beak strong, superior mandible bearing a strongly marked tooth. Nostrils rather oval, wings two-thirds of the length of the tail; first remex much shorter than the second, the third almost equal to the fourth, which is the longest. Toes long, the middle much surpassing the lateral, nails much curved, and very sharp. Their flight is rapid, without shaking their wings much; it is only in pairing time that they describe circles in flying; they are cunning and malicious, and seize their prey flying; they mostly inhabit large woods, particularly those in the neighbourhood of rocks.—*Tem.*

(3) Beak curved at its base; feathers of the head elongated and terminated in a point; mouth cleft as far as under the eyes; nostrils oblique, their exterior edge marked with a fold; the first remex of the wing shorter than the sixth, the second a little shorter than the fifth, the third almost equal in length to the fourth, which is longer than all. In a state of repose they have an awkward attitude, but their flight is elegant; they seem to swim in the air, describing circles; they do not seize their prey when flying, but they fall upon it from above, when it is resting on the ground or on some elevation. *Tem.*

The *Pernis* tribe has, with the weak beak of the Kite, a very peculiar character, which is, that the interval between the eye and the beak, which in all the others of the Genus *Falco* is naked, or only presenting a few hairs, is covered with very close feathers, cut into scales. Their tarsi are half feathered in the upper part, and reticulated; they have an even tail, long wings, and the beak curved from its base, like all those which follow. *Falco Apivorus*, (Honey Buzzard, *Lath.*) *La Bondree Huppée de Java*.

The *Buteo* tribe has the wings long, the tail equal, and the beak curved from its base, the interval between which and the eye is without feathers; the feet strong. There are some with the tarsi feathered even to the toes (*F. Pennatus*); but the greater number have the tarsi naked and plated (*F. Buteo. Bacha*, *Vail.*). They are distinguished from *Eagles* by their beak, curved from its base; from *Autours*, or *Eagle Autours*, by tarsi covered with strong feathers, and by their long wings. (1)

The *Circus* tribe differs from the *Buteo* by more elevated tarsi, and by a species of collar, formed on each side of the neck by the ends of the feathers which cover the ears; fig. 54. (2) *Falco Pygargus*, (Ring-tailed Hen-harrier, *Lath.*) *Falco Rufus* (Harpy Falcon, *Lath.*)

The *Serpentarius*, or *Secretary*, is an African Bird of Prey, with the tarsi at least double the length of all the other Birds of this Family, which has made naturalists class it with the *Grallæ*; but its thighs, entirely covered with feathers, its beak crook'd and cleft, its projecting eyebrows, and all the details of its anatomy, place it in the present Order. Its tarsi are plated; its toes short in proportion; the orbit of its eye naked of feathers; it has a long stiff occipital crista, and the two middle pen feathers of its tail greatly surpass the others. It inhabits the sterile and open places in the neighbourhood of the Cape, where it pursues reptiles on foot, and has nails worn by dint of walking; fig. 57, 50. Its principal strength is in its feet. (3)

(1) Beak weak, with a rounded tooth (not very apparent); the head large; the body massive and heavy. Feet with short tarsi; thighs breeched. Wings of a moderate length, the four first remiges sloped, the first very short, the second and third less long than the fourth, which is the longest. They have a heavy flight, do not take their prey flying, but generally lay wait for it in ambush on a tree. *Tem.*

(2) Beak small, superior mandible curved from its base, bearing a blunted tooth (not very apparent) at the root of the beak, and some straight hairs which hide a part of the cera. Nostrils open. Feet with very long and thin tarsi; body slender; tail long. *Tem.*

(3) This Bird was introduced into the French West India Islands, to destroy the numerous serpents.

TRIBE I. AQUILÆ.

DIVISIONS.

1. EAGLES PROPER, *Cuv.*

Tarsi covered with feathers to the bases of the toes, reticulated. Wings as long as the tail.

2. HALIÆTUS, *Savigny.*
AIGLES PÊCHEURS, *Cuv.*
FISHING HAWKS, *Latham.*

Tarsi covered with feathers half way down, the remaining half plated. p. 25. Ditto.

3. HARPYIA, *Cuv.* SHORT-
WINGED FISHING EAGLES.

Tarsi very large and strong, half feathered, reticulated. Wings shorter than the tail. Very strong beak and nails.

4. MORPHNUS, or AIGLE
AUTOUR, *Cuv.*

Tarsi long and slim, half feathered. p. 25. Ditto. Toes weak.

3. CYMINDIS, *Cuv.*

Tarsi very short, reticulated, half covered with feathers in front. Ditto. Nostrils almost closed, or like a fine slit.

Eagles Proper have their tarsi feathered to the root of the toes; they live in mountains, and pursue Birds and Quadrupeds; their wings are as long as their tails; their flight is as high as rapid, and their courage surpasses that of all other birds. *Falco Fulvus*, (Black Eagle, Ring-tailed Eagle, *Lath.*) *Falco Chrysaetos*, (Gold Eagle, Gold Adler, *Lath.*) etc.

The *Harpies*, or Fishing Eagles with short wings, are American Eagles; their tarsi are very large, very strong, reticulated, and half feathered, like the Fishing Eagles properly so called; from which they only differ by the shortness of their wings; their beak and nails are even stronger than in any other tribe. *Falco Harpyia* (Oronooko Eagle, *Lath.*).

The *Cayenne Falcon* of Latham is a *Cymindis*.

DIVISION II. HALIÆTUS.

SUB-DIVISIONS.

1. HALIÆTUS. PROP.

Nails *grooved* underneath, as in all the other Birds of Prey.

2. PANDION, *Savigny*.
BALBUSARDS, *Cuv.*

Nails *round* underneath.

3. CARACARA.

Part of the side of the head, and sometimes of the neck, naked of feathers. Fig. 32.

The first Sub-division have the same wings as the *Eagles Proper*, but the tarsi are only covered with feathers on their upper half and half-plated on the other. They frequent the borders of rivers and the sea-shore, and live mostly on fish. *Falco Ossifragus*, (Sea Eagle or Osprey, *Lath.*) *Falco Leucocephalus* (White-headed Eagle, Bald Eagle, *Lath.*).

The *Pandions* have the beaks and feet of the former, but their nails are round underneath, whilst in other Birds of Prey they are hollowed into a groove; their tarsi are reticulated, and the second feather of their wings is the longest. We know but one species, spread through almost the whole of the globe on the banks of fresh waters, with few variations in the plumage.

America produces Fishing Eagles with long wings, like the preceding, where a larger or smaller portion of the sides of the head, and sometimes of the throat, is naked of feathers. They give them the common name of *Caracara*. Brazilian Kite, *Lath.* etc.

DIVISION IV. MORPHNUS.

SUB-DIVISIONS.

11.

Tarsi naked, and plated.

12.

Tarsi covered with feathers all the way down.

1. *Urubitinga* (Brazilian Eagle, *Lath.*) 2. *Urutaurana* (Crowned Eagle, *Lath.*).

TRIBE II. ASTUR.

DIVISIONS.

1. ASTUR PROPER.

Tarsi plated, and rather short.

2.

Tarsi short, but reticulated.

3. NISUS, *Cuv.*

Tarsi longer, but plated.

1. *F. Palumbarius* (Goshawk, *Lath.*). 2. *F. Cachinnans* (Laughing Falcon, *Lath.*). 3. *F. Musicus*, the only known species of Birds of Prey which sings agreeably. *F. Nisus* (Sparrow Hawk, *Lath.*).

TRIBE III. MILVUS.

DIVISIONS.

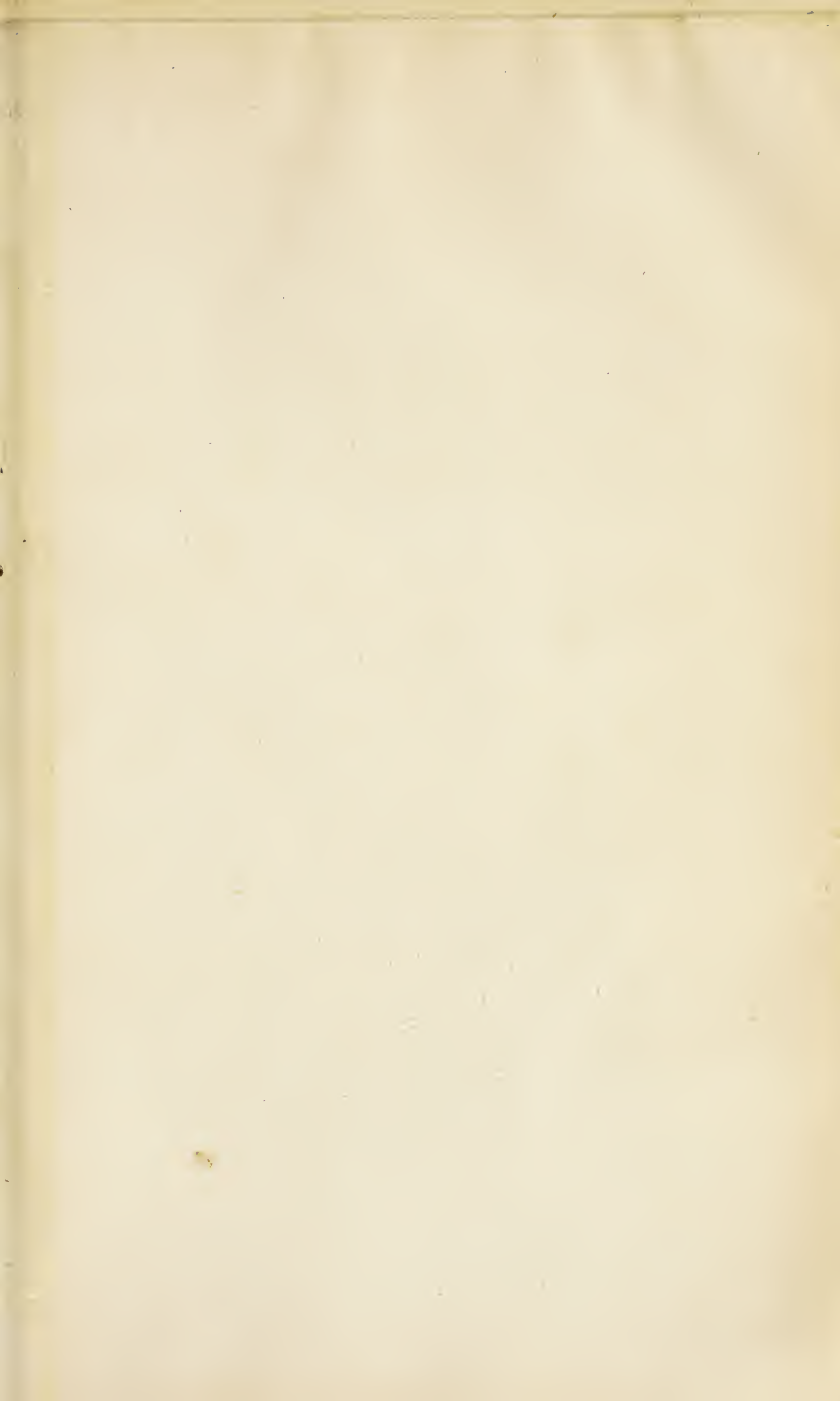
1. ELANUS, *Savigny*.

Tarsi very short, reticulated, covered with feathers half way down.
Fig. 40.

2. MILVUS PROPER, *Cuv.*

Tarsi stronger, and plated.

1. Le Blac. *Le Vaillant*. *F. Furcatus* (Swallow-tailed Falcon, *Lath.*). 2. *F. Milvus* (Kite).



44.

43.

46.

45.



FAMILY II. NOCTURNÆ.

GENUS I. STRIX.

SUB-GENERA.

1. STRIX, *Lin.*

Orifice of the ear large. A large circle of fine feathers round the eyes. Small collar of scaly feathers.

2. NOCTUA, *Savigny.*

Orifice of the ear oval, and not much larger than in other birds. Circle of feathers small and imperfect. p. 29.

The Sub-genus *Strix* may be divided according to the egrets, the size of the ears, the extent of the circle of feathers which surrounds the eyes, and some other characters.

Those species which have a large complete disk of fine feathers, encircled by a small collar of scaly feathers, and, between the two, a large orifice of the ear, are more distant in form and manners from the *Diurnæ*, than those whose ears are small, oval, and covered by fine feathers which come from below the eye. We observe traces of these differences even in the skeleton. (1)

The Sub-genus *Noctua* has not the wide and deep conch of the ear, the orifice of which is oval scarcely bigger than that of other birds; the disk of fine feathers is less large and less perfect.

(1) Beak compressed, base encircled by a cere, covered entirely, or in part by rude hairs. Nostrils lateral, pierced on the anterior edge of the cere, rounded, open, hid by hairs directed in front. Iris brilliant; wings a little pointed, the first remiges dentated on their exterior edge; the first the shortest, the second not reaching the extremity of the third, which is the longest; their eyes are dazzled by the light of the sun, but they see very well during the day. The bones, hairs, and feathers of their prey, after the flesh has been well digested, are rejected in little balls.—*Tem.*

SUB-GENUS I. STRIX.

TRIBES.

1. OTUS, *Cuv.*

Egrets raised at will.

Conch of the ear extended in a semi-circle from the beak towards the top of the head, and furnished with a membranous operculum. Tarsi feathered to the nails.

2. ULULA.

No Egrets.

Ear and beak of *Otus*. Tarsi feathered to the nails.

3. STRIX, *Savigny*.

No Egrets.

Beak elongated, curves only towards the end; ear of *Otus*. Tarsi feathered, but only hairs on the toes.

4. SYRNIUM, *Savigny*.

No egrets.

Conch reduced to an oval cavity, not occupying half the height of the skull. Tarsi feathered to the nails. Tail short.

5. BUBO.

Egrets.

Conch of the *Syrnium*, but the circle of feathers around the eye less marked.

§ Egrets wider, further back and difficultly raised from a horizontal line. (6)

1. *Strix Ascalaphus*. 2. *S. Litturata*. 3. *S. Flammea*. 4. *S. Aluco*.
5. *S. Bubo*. Fig. 43. (6) *Chouette à aigrettes*, *Vaill.* Fig. 42.

SUB-GENUS II. NOCTUA.

TRIBES.

1. SURNIA, *Dumeril*.

A long tail, graduated.

Toes well feathered.
Fig. 44.

2. NYCTEA.

Short tail.

Toes feathered.

3.

Short tail.

Toes naked.

4. NUDIPES.

Tarsi and toes naked.

5. SCOPS, *Savigny*.

Ears even with the head.

Toes naked.

No egrets.

Egrets.

1. *Siberian Owl. Choucou, Vaill.* Fig. 40. 2. *Harfang* (S. *Nyctea*).
Fig. 46. 3. *Cayennensis*, etc. 4. *S. Nudipes*, *Daud.* 5. *S. Scops*.

END OF THE FIRST ORDER.

ORDER II.

Passeres.

THE character of this Order, the most numerous of the whole Class, seems at first to be simply negative, since it embraces all the Birds which are neither *Palmipedes*, *Grallæ*, *Scansores*, *Accipitres* or *Gallinaceæ*; comparison, however, presents a great resemblance in their structure, and such insensible passages from one Genus to another, that it is very difficult to establish the subdivisions.

We find the Singing Birds and, consequently, the most complicated inferior larynxes (p. 7, note 2.) amongst the *Passeres*.

DIVISIONS.

1. Exterior toe united to the middle toe by one or two joints only.

2. Exterior toe almost as long as the middle toe and united with it as far as the last joint but one, p. 50.

DIVISION I.

FAMILIES.

1. DENTIROSTRES.

Beak notched on each side of the point. Fig. 47, p. 34.

2. FISSIROSTRES.

Beak short, wide, flattened horizontally, slightly crook'd, without notch, deeply cleft. Fig. 77, (1) p. 41.

(1) Their mouth is consequently so very large that they easily swallow the insects which they take in their flight : being entirely insectivorous, they quit us in winter. They approach the tribe *Muscicapa*, and especially the *Procnias*, whose beak scarcely differs but by the notch.

3. CONIROSTRES.

Beak strong, more or less conical, without notch. Fig. 78, p. 42.

4. TENUIROSTRES.

Beak slim, elongated, more or less arched, without notch. Fig. 91, p. 48.

FAMILY I. DENTIROSTRES.

GENERA AND SUB-GENERA.

1. LANIUS, *Lin.*

Beaks conical or compressed, more or less crook'd at the end.

a. L. PROPER. SHRIKES.

Beak triangular at base, compressed at the sides.

α Beak with the superior edge *arched*. (1)

β straight, crook'd only at the end. Fig. 49.

γ lower mandible much swelled. Fig. 50.

δ (*VANGA, Buff.*) Beak large, much compressed, point much crook'd, and that of the inferior mandible curved upwards. Fig. 51.

(*PLUMATÆ.*) .. straight and slim, with crests of straight feathers. Fig. 52.

b. OCYPTERUS, *Cuv.* LANGRAN.

Beak conical, rounded, without edge, point very fine, slightly notched on each side. Fig. 164, *bis*.

Wings, as long and longer than the tail, affording the same flight as the *Swallows*.

(1) Those in which the point is strong and much crook'd, possess a courage and cruelty which has induced many Naturalists to associate them with the *Accipitres* or *Birds of Prey* (See p. 14). The beaks of the *Lanii* of the other parts of the world diminish in size and become gradually weaker in their points, according to the species, so that it is impossible to establish a limit between this Sub-Genus and that of *Turdus*: amongst those with the stronger beak is the *Fiscal*, Fig. 47; amongst those approaching the *Turdi*, the *Oliva*. Fig. 48.

c. BARITA, Cuv. CASSI-
CANS, Buff.

Beak large, conical, straight, round at its base, sloping out the feathers of the forehead in a circle, rounded on the back, compressed at the sides, the point crook'd and notched laterally. Fig. 55.

d. PSARIS, Cuv. BECAR-
DES, Buff.

Beak conical, very large, round at the base, not sloping out the forehead, point slightly compressed and crook'd.

e. GRAUCALUS, Cuv.
CHOUCARIS, Buff.

Beak less compressed than in the *Lanii proper*, arched equally in its whole length; the commissure (1) a little arched. Fig. 156.

Feathers sometimes covering the nostrils.

f. BETHYLUS, Cuv.

Beak large, short, swelled in every part, slightly compressed towards the end. Fig. 53.

2. TANAGRA, Lin. TA-
NAGERS.

Beak strong, conical, triangular at the base, slightly arched at the upper edge.

Wings and flight short.

a. T. EUPHONES. BOU-
VREUILS.

Beak short and presenting, when viewed vertically, an enlargement on each side of the base. Fig. 54.

Tail short in proportion.

(1) *Commissura labiarum*. Fig. 154, c.

b. T. GROSS-BEAKS.

Beak large, swelled, as broad as deep, and the back of the upper mandible rounded.

c. T. PROPER.

Beak shorter than the head, as broad as deep, upper mandible arched. Fig. 56.

d. T. LORIOTS.

Beak arched, sharp-edged.

e. T. CARDINALS.

Beak a little swelled, a projecting obtuse tooth on the side. Fig. 57.

f. T. RHAMPHOCELES.

Inferior mandible enlarged towards the base. Fig. 59.

3. MUSCICAPA, *Lin.* FLY CATCHERS.

Beak depressed horizontally, with hairs at the base, and the point more or less crook'd and notched.

a. TYRANNUS, *Cuv.*

Beak straight, long, very strong, upper *culminating* edge (1) straight, blunt, the point suddenly crook'd. Fig. 61.

The larger species *carnivorous*.

b. MUSCIPETA, *Cuv.*
GNAT-SNAPPERS.

Beak long, *much* depressed, twice as broad as deep, *culminating* edge very obtuse, point feeble, long hairs at the base. Fig. 62.

Several are ornamented with crests and long feathers in their tail.

(1) "*Arête supérieure.*" Fig. 157, *a.*

c. MUSCICAPA, Cuv.

Mustachios shorter and beak narrower than in the *Muscipeta*, point a little crook'd. Fig. 157, *bis*.

d. GYMNOCEPHALUS,
Geoff. BALD-HEADS.

Beak of *Tyrannus*, but the *culminating* edge more arched and a great part of the face naked of feathers. Fig. 60. *Choucas chauve*, Buff.

e. CEPHALOPTERUS, Geoff.

Base of the beak furnished with a bunch of raised feathers in the form of a parasol. Fig. 101. *C. Ornatus*.

4. AMPELIS, Lin. CO-
TINGA.

The depressed beak of the *Muscicapa*, but shorter in proportion, broad, and slightly arched.

a. PIAUHAU.

Beak stronger and more pointed. Fig. 64.

Insectivorous. America.

b. C. PROPER.

Beak weaker.

Wings of males coloured with brilliant azure and purple in the pairing season.

c. CEBLEPYRIS, Cuv. CA-
TERPILLAR-CATCHERS.

Stems of the feathers of the rump elongated, stiff and pointed.

Tail a little forked in the middle, graduated at the sides. No brilliancy of colour. Africa. India.

d. BOMBYCIVORA, Tem.
CHATTERERS.

Ends of the stems of the *secondary* feathers of the wing enlarged into a smooth, oval, *red* disk.

e. PROCNIAS, *Hofm.*

Beak weaker, more depressed, and cleft to below the eye. Fig. 162.

f. GYMNODERES, *Geoff.*
NAKED-NECKS.

Beak stronger.

Neck partly naked and the head covered with velvet-like feathers.

5. EDOLIUS, *Cuv.* DRONGO.

Beak depressed and sloped at the end, the culminating edge sharp, *both mandibles slightly arched in their whole length.* Fig. 65.

Nostrils covered with feathers and long hairs like mustachios.

Generally tinted with black, and with forked tails.
Insectivorous.

6. TURDUS, *Lin.*

Beak compressed and arched, but without crook, and the notches less marked than in the *Lanius*. Fig. 96.

Generally frugivorous : habits solitary.

a. BLACKBIRDS.

Colours uniform, distributed in large masses.

b. THRUSHES.

Plumage speckled, marked with small black or brown spots.

7. PYRRHO-CORAX, *Cuv.*

Beak of *Turdus*, but nostrils covered with feathers. Fig. 102. *Sicrin*.

8. ORIOLUS, *Lin.* (1)

Beak of *Turdus*, but rather stronger.

Feet shorter in proportion. Fig. 67.

(1) Linnæus and his successors united them to the *Cassicans*, which they resemble only in their colours.

9. MYOTHERA, *Illig.*
ANT THRUSHES.

Legs long. Fig. 107. *bis.* Tail short.

10. CINCLUS, *Bechst.*
WATER OUZELS.

Beak compressed, straight, mandibles equally deep, almost in a line, sharpening towards the points, and the superior scarcely arched.

11. PHILEDON.

Beak compressed, slightly arched in its whole length.

Nostrils large, covered by a cartilaginous scale; tongue terminated by a pencil of hairs. Fig. 69 and 71, (*P. carunculata*).

Africa and the countries bordering on the Red Sea.

12. GRACULA, *Cuv.* GRACKLES.

Beak compressed, very slightly arched and notched: the commissure forming an angle as in the *Sturnus*. Fig. 73. *G. carunculata*.

Feathers of the head generally narrow and a naked space around the eye.

Ditto.

13. MENURA, *Shaw.*
LYRE-TAILS.

Beak triangular at the base, elongated, a little compressed. Fig. 109.

Nostrils large, membranous, and partly covered with feathers.

The males with large tails of 16 feathers, the 2 exterior curved like a lyre. (1)

(1) They have been referred by some authors to the *Gallinaceæ*, from their size, but their feet are evidently those of *Passeres*.

14. PIPRA, *Lin.* MANAKINS.

Beak compressed, deeper than broad; nasal canals large. 2 exterior toes united nearly half their length. Tail and feet short. America.

a. RUPICOLA.

A double crest of feathers on the head, like a fan. Fig. 111. Large.

b. PIPRA, *Cuv.*

Small. Fig. 68.

Remarkable for their lively colours : live in troops in damp forests.

15. MOTACILLA, *Lin.*

Beak straight, slender, like a bodkin.

a. SAXICOLA, *Bechst.*

Beak depressed, rather large at the base. Fig. 74. Nest on or under the ground. Live on insects only.

b. SYLVIA, *Wolf.* FICEDULA, *Bechst.*

Beak rather narrower at the base. Fig. 165. Solitary : nest in holes. Live on insects, worms, and berries.

c. CURRUCA, *Bechst.*

Beak straight, slim, a little compressed in front, the culminating edge a little curved towards the point. Fig. 158.

α (NIGHTINGALES.) Nest in trees.

β bushes.

d. REGULUS, *Cuv.* WRENS.

Beak perfectly conical and very sharp ; its sides, when viewed vertically, appearing rather concave. Fig. 75.

e. TROGLODYTES, *Cuv.*

Beak still slighter than in the *Regulus* and a little arched.

f. MOTACILLA, *Bechst.*
WAG-TAILS.

A long tail, which they move up and down incessantly.

Legs long; the *scapular* feathers sufficiently long to cover the end of the wing when folded.

α. LAVANDIERES.

Nail of the great toe curved as in all the other *Motacillæ* except the *Budytes*.

β. BUDYTES.

Nail of the great toe elongated and a little arched.

Live in pastures; pursue insects.

g. ANTHUS, *Bechst.*

Beak slim.

Nail of the great toe long.

Scapular feathers of ordinary length.

FAMILY II. FISSIROSTRES.

GENERA AND SUB-GENERA.

§ *Diurnæ*. Close, firm, plumage.

1. HIRUNDO, *Lin.*

Wings extremely long, flight rapid.

a. APUS, *Cuv.* CYPSELUS,
Illig. MARTINS.

Feet very short; the great toe directed forwards and the middle and exterior toes with only *three* joints like the inner.

Tail *forked*.

Sternum without notch (1). Nest in holes of walls and rocks; climb along the smoothest surfaces.

b. HIRUNDO, *Cuv.* SWAL-
LOWS.

Toes and sternum as in the generality of *Pas-seres*.

(1) Ordinarily there is one notch on each side of the lower edge.

α Tail forked. (1) { Toes feathered.
 { .. naked.

β Tail almost square.

γ Tail square with the pen feathers terminating in a point.

§§ Nocturnæ. Light, soft, plumage shaded with grey and brown.

2. CAPRIMULGUS, Lin.

GOAT-SUCKERS.

Beaks more cleft, with strong mustachios; nostrils, at the base, in the form of small tubes; eyes large. Fig. 77. The exterior toes with only 4 joints, and all the toes united by a short membrane. Feet short, tarsi feathered. The air gulphed in their large beak when flying produces a peculiar huz.

a . Nail of the middle toe *dentated* on its inner edge. Tail square.

b . Nail not *dentated*. Tail forked.

3. PODARGES.

Beak stronger. Fig. 163. No membrane between the toes.

FAMILY III. CONIROSTRES.

GENERA AND SUB-GENERA.

1. ALAUDA, Lin. LARKS.

Nail of the great toe straight, strong, and much longer than the others. Granivorous; frequent the ground.

a . Beak straight, moderate, pointed.

b . Beak so large as to approach that of the *Fringilla*. Fig. 78.

c . Beak elongated, a little compressed and arched, approximating them to the *Upupæ* and *Promerops*.

(1) The Salangane (*H. esculenta*, Lin.), a small species of the Indian Archipelago, is celebrated for its nest of a whitish gelatinous substance, made, as it is believed, from the spawn of fish or some scum from the surface of the sea: the restorative virtues attributed to these nests have made them an important article of commerce in China; they are dressed like mushrooms.

2. PARUS, *Lin.* TITMICE.

Beak slender, short, conical, straight. Fig. 70. Small hairs at the base of the beak, and the *nostrils hidden by feathers*.

a. PARUS PROPER.

b. MOUSTACHES.

The end of the superior mandible curving on the other.

c. REMIZ.

Beak more slim and pointed.

Display great art in forming their nests, in the shape of purses or bottles.

3. EMBERIZA, *Lin.* BUNTINGS.

Beak conical, short, straight, superior mandible narrower, entering within the inferior. Fig. 72. A projecting, hard, tubercle in the palate.

4. FRINGILLA, *Lin.*

Beak conical, more or less large at the base, but the commissure not angular.

a. PLOCEUS, *Cuv.* TISSERINS. WEAVERS.

Beak as large as in the *Cassicans*, but the commissure straight and the superior mandible slightly swelled. Fig. 79.

The greater part of those of the Old Continent make their nests with much art, interlacing sprigs of herbs (1).

b. PYRGITA, *Cuv.*

Beak shorter, and a little swelled towards the point only. Fig. 159.

(1) The nest of the *Toucnam Courvi* (*Loxia Philippina*) is suspended, in the form of a ball, with a vertical canal, open underneath, which communicates sideways with the cavity containing the young.

c. FRINGILLA, Cuv. CHAFFINCHES.

Beak less arched than in the *Pyrgita*, and a little stronger and longer than in the *Linaria*. Fig. 103. 104.

d. CARDUELIS, Cuv.

Beak conical and entirely free from swell. Fig. 80.

α. CHARDONNERETS.
GOLDFINCHES.

Beak longer and sharp.

β. LINARIA, Bechstein.
LINNETS.

Beak shorter and obtuse.

e. VIDUA, Cuv. WIDOW BIRDS.

Beak of *Linaria*, sometimes a little swelled at the base. Fig. 95.

Tectrices superiores of the tail excessively elongated in the *males*.

f. COCOTHRAUSTES. GROSSBEAKS.

Beak conical and large.

g. PITYLUS, Cuv.

Beak very large, a little compressed, arched above, and sometimes with a projecting angle in the middle of the edge of the upper jaw.

h. PYRRHULA. BULLFINCHES.

Beak rounded and swelled in every part. Fig. 81.

5. LOXIA, Briss. CROSSBILLS.

Beak compressed; the mandibles so much curved that the points cross each other. Fig. 82.

6. CORYTHIUS, *Cuv.*
HARD-BEAKS.

Beak swelled in every part; the point of the upper curved over the lower mandible. Fig. 85.

7. COLIUS, *Gm.* COLIES.

Beak short, thick, conical, a little compressed; the two mandibles arched without crossing.

The great toe has the power of directing itself forwards.

Pen-feathers of the tail *graduated*, and very long.

8. GLAUCOPIS, *Forster.*
CALLÆAS, *Bechst.*
WATTLE-BIRDS.

Upper mandible swelled.

A fleshy *caruncula* under the base of the beak. Fig. 83.

9. BUPHAGA, *Briss.*
BEEF-EATERS.

Beak cylindrical at the base, swelling towards the middle; the point blunt. Fig. 84.

10. CASSICUS, *Cuv.* CASSICANS.

Beak large, conical, enlarged at the base, sharpened into a point; the *commisure* in a broken line or forming an angle as in the *Sturni*.

Small round nostrils, pierced at the sides.

a. CASSICUS PROPER.

Base of the beak rises on the forehead and slopes out the feathers in a semi-circle. Fig. 100.

b. ICTERUS.

Slope of the forehead angular and the beak arched.

c. XANTHORNUS.

Slope angular, but
beak straight.

d. DACNIS, Cuv. PIT-PITS.
Buff.

Beak conical and
sharp.

They form a passage
to the Sub-Genus *Regulus*.

11. STURNUS, L. STARES,
STARLINGS.

Beak of *Xanthornus*,
but depressed towards
the point. Fsg. 94.

Relieve the cattle
from insects, which
they feed on; quit us
in winter.

12. SITTA, Lin. NUT-
HATCHES.

Beak straight, prism-
atic, pointed for cutting
the bark to get at the
worms. Fig. 98.

Hind toe very strong.

Tail affords no sup-
port in climbing.

13. CORVUS, Lin.

Beak strong, more or
less flattened at the sides.

Nostrils covered by
stiff hairs, directed for-
wards.

a. (1) CORVUS PROPER.

Beak stronger in pro-
portion and the culmi-
nating edge more arch-
ed than in the others.
Fig. 86. *C. Corax*.

Tail round or square.

b. PICA, Cuv. MAGPIES.

Ditto. Fig. 63.

Tail long and gradu-
ated.

c. GARRULUS, Cuv. JAYS.

Mandibles rather
short and terminating
in a sudden curve. Fig.
87.

(1) The Corbeau (*C. corax*, Lin.) in Cuvier, is our *Raven*; the Corneille (*C. corone*, Lin.), the *Carrion Crow*; the Freux (*C. frugilegus*, Lin.), the *Rook*; the Corneille Mantelée (*C. cornix*, Lin.), the *Hooded Crow*; the Choucas (*C. monedula*, Lin.), the *Jackdaw*.—*Regne Animal*, t. i. p. 397.

d. CARYOCATACTES, *Cuv.*
NUT-CRACKERS.

Mandibles equally pointed, straight, without curve. Fig. 58.

e. TEMIA.

Beak round, the base furnished with velvet-like feathers. Fig. 108.

14. CORACIAS, *Lin.* ROLLERS.

Beak strong, compressed towards the end, the point a little crook'd.

Nostrils oblong, not covered by the feathers.

Feet short and strong. Two notches on each side of the lower edge of the *sternum*.

a. CORACIAS PROPER.

Beak straight, and deeper than broad. Fig. 88.

b. COLARIS, *Cuv.*

Beak shorter, more arched, and enlarged at its base, so as to be broader than deep. Fig. 89.

c. EULABES, *Cuv.*

Beak of *Coracias*.

Head partially naked of feathers, with fleshy prominences in stead. Fig. 116.

Velvet-like feathers, advancing to the edge of the nostrils as in the *Paradisæa*.

15. PARADISÆA, *Lin.*
BIRDS OF PARADISE.

Beak of *Corvus*. Fig. 110.

Feathers covering the nostrils, velvet-like, and often of a metallic lustre; those of different parts of the body singularly developed.

FAMILY IV. TENUIROSTRES.

GENERA AND SUB-GENERA.

1. UPUPA, *Lin.* HOOPoes.*a.* FREGILUS, *Cuv.*

Beak longer than the head. Fig. 155. Nostrils covered with feathers directed forwards.

b. UPUPA PROPER.

A double row of feathers on the head, erected at will. Fig. 118.

c. PROMEROPS, *Briss.*

Tongue extensible and forked. Fig. 115. No crest.

Tail very long; live on the juices of flowers.

d. EPIMACHUS, *Cuv.*

Scaly or velvet-like feathers covering a part of the nostrils. Fig. 161.

2. CErTHIA, *Lin.* CReEP-ERS.*a.* CErTHIA PROPER.

Climb trees like the *Pici*, using their tail as a support, the pen-feathers of which are worn and terminate in stiff points. Fig. 90, *bis*.

b. DENDROCOLAPTES, *Her.*
PICUCULES.

Beak stronger, and broader transversally. Ditto.

c. TICHODROMA, *Illig.*

Beak triangular, depressed at the base, very long and slim. Fig. 117. Tail not worn.

Use their *long nails*; only, in climbing, Fig. 117.

d. NECTARINIA, *Illig.* SUGAR-BIRDS.

Beak moderately long, arched, pointed and compressed as in the *Certhia*. Fig. 114. Ditto.

e. DICEUM, *Cuv.*

Beak sharp, arched,
not longer than the
head, depressed and en-
larged at the base. Fig.
113.

Tail not worn.

f. HOEROTARIA, *Vaill.*

Beak extremely elon-
gated, curved almost in
a semi-circle. Fig. 93.

Ditto.

g. CINNYRIS, *Cuv.* SUGAR-
EATERS.

Beak long and slim,
the edges of both man-
dibles finely dentated;
tongue terminated in a
fork and elongating. Fig.
93.*

Ditto.

Live on flowers only.

3. TROCHILUS, *Lin.* HUM-
MING-BIRDS.

Beak long and slim;
tongue elongating and
bifid.

Plumage of a metal-
lic lustre.

Live on flowers and
insects. No notches in
the *sternum*.

a. COLIBRIS.

Beak arched. Fig. 99.

T. cinereus.

b. ORTHORHYNCHUS, *La-
cep.* FLY-BIRDS.

Beak straight. Fig. 97.

T. minimus.

DIVISION II. SYNDACTYLÆ.

GENERA.

1. MEROPS, *Lin.* WASP-EATERS. BEE-EATERS.

Beak triangular at its base, elongated and slightly arched, terminating in a sharp point. Fig. 119.

Feet short. Fig. 119.

Two notches on each side of the lower edge of the *sternum*.

2. PRIONITES, *Illig.*

Beak stronger, edges indented, tongue barbed. Fig. 92.

3. ALCEDO, *Lin.* KING-FISHERS.

Beak longer than *Merops*, straight, angular, pointed; tongue very short. Fig. 120.

Feet shorter than *Merops*. Fig. 120.

Tail very short. *Sternum* as *Merops*.

4. CEYX, *Lacép.*

Beak as *Alcedo*.

Inner toe not apparent.

5. TODUS, *Lin.* TODIES.

Beak flattened horizontally, obtuse at its extremity. Fig. 106.

6. BUCEROS, *Lin.* HORN-BILLS.

Beak enormous, notched, surmounted by prominences sometimes equalling it in size. Fig. 105. *C. unicornis*.

ORDER III.

Scansores. Climbers.

These are Birds whose exterior toe directs itself backwards like the great toe, affording a very solid support, by which some of them profit for clinging to and climbing the trunks of trees. They have consequently received the name of *Climbers*, although it is not strictly applicable to all; whilst several Birds which climb do not belong to this Order by the disposition of their toes.

The *Scansores* generally rest in the holes of old trees : their flight is moderate ; their food, like that of the *Passeres*, generally consists of insects or fruits, according to the strength of their beak ; some, as the *Pici*, have peculiar means for obtaining it.

The sternum of most of the Genera has two notches behind (Fig. 121), but in the *Parrots* there is only a hole (Fig. 122), not unfrequently filled up.

GENERA AND SUB-GENERA.

1. JACAMAR. GALBULA.

Briss.

Beak elongated, pointed, upper culminating edge sharp.	Feet short, exterior toes united in a great part of their length.	Plumage of a metallic lustre. Live isolated in damp woods. Insectivorous.
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a. Beak longer and perfectly straight. Fig. 123.
G. ruficauda.

America.

b. Beak shorter, larger, and a little arched. Fig. 124. *Jacamerops* or *G. grandis.*

Anterior toes more separated.

Indian Archipelago.

c. No upper culminating edge to the beak. Fig. 126. *Great Jacamar.* Vaill.

2, *PICUS*, *Lin.* WOOD-
PECKERS.

Beak long, straight, angular, compressed in a wedge at the extremity, for clearing the barks of trees. Tongue protractile, slim, armed with spines towards the end, which curve backwards. (1) Tail with 10 pen-feathers, the stems stiff and elastic, supporting them as a buttress in climbing. Fig. 125.

a. *P. PROPER.*

Fig. 125.

b. *PICOÏDES*, *Lacép.* TRI-
DACTYLÆ.Only 2 toes before and
1 behind. Fig. 127.*c.*Beak slightly arched,
approaching that of the
Cuckows. Fig. 129.3. *YUNX*, *Lin.* TORCOLS.
WRY-NECKS.

Beak straight, pointed, almost round and without angles. Fig. 166. Tongue protractile, but without spines. Tail with pen-feathers of the ordinary form.

4. *CUCULUS*, *Lin.*
CUCKOWS.

Beak moderate, somewhat cleft, compressed, slightly arched. Tail rather long. Birds of passage. Insectivorous.

a. *C. PROPER.*Beak of moderate
length. Fig. 130. (2)

Tarsi short. Fig. 132.

Tail with 10 pen-feathers.

b. *COUAS*, *Vaill.*

Tarsi long. Fig. 134.

(1) The tongue, pushed out by the elastic cartilaginous prolongations of the os hyoïdis (Fig. 128, *c.*), elongates considerably beyond the beak (Fig. 125) and is imbued with a viscous juice, furnished by large salivary glands : it is drawn in by two muscles, rolled like ribbands around the trachea, the cornea of the os hyoïdis reascending under the skin and upon the head as far as the superior base of the beak (Fig. 128.), and the sheath of the tongue folding on itself at the bottom of the gullet.

(2) There are African species with the beak more depressed (Fig. 131. *C. auratus*) and others with the beak deeper vertically. (Fig. 132. *C. Tachirou.*)

c. COUCALS, *Vaill.* CENTROPUS, *Illig.*

Nail of the great toe long, straight, pointed. Fig. 135.

d. COUROLS. VOUROUDRI-
OUS, *Vaill.*

Beak large, pointed, scarcely arched. Fig. 137. Nostrils pierced obliquely in the middle. Tail with 12 pen-feathers.

e. INDICATORS, *Vaill.* HONEY CUCKOWS.

Beak short, deep, almost conical. Fig. 136.

Ditto.

f. BARBACOUS, *Vaill.*

Beak conical, elongated, slightly arched at the end. Fig. 138. Fine feathers or stiff hairs at the base of the beak. Tail a little graduated and forked.

5. MALCOHAS, *Vaill.*

Beak very large, round at the base; a naked space around the eye.

Ceylon.
Frugivorous.

a.

Nostrils round, and towards the base of the beak. Fig. 139.

b.

Nostrils narrow, and near the edge. Fig. 140.

6. SCYTHIOPS, *Lath.* PSITTACEOUS HORN-BILLS.

Beak larger and longer than the *Malcohas*, with two shallow longitudinal furrows on each side. Fig. 141. Nostrils round; circle around the eye naked.

New-Holland.

7. BUCCO, *Lin.* BARBETS.

Beak large, conical, swelled at the sides of the base. 5 bundles of stiff hairs, directed forwards; 1 behind each nostril, 1 on each side of the base of the lower jaw, and the 5th under the symphysis.

Wings short.

a. *POGONIAS*, *Illig.* BAR-
BICANS.

Two deep notches on each side of the upper mandible, and its culminating edge blunt and arched; the lower mandible furrowed transversally underneath. Fig. 142.

Hairs very strong.

Africa. India.

b. *BUCCO* PROPER.

Beak simply conical, slightly compressed; culminating edge blunt, and a little raised in the middle. Fig. 143.

Both continents.

c. *TAMATIAS*.

Beak more elongated and compressed, with the extremity of the upper mandible curved downwards. Fig. 144.

Tail short.

America.

8. *TROGON*, *Lin.* CURU-
CUIS.

Beak short, broader than deep, curved from the base; upper culminating edge arched, blunt, and the lateral edges notched. Fig. 145.

Tail short.

Small feet, with feathers almost to the toes.
In both continents.

9. *CROTOPHAGA*, *Lin.* ANIS.

Beak large, compressed, arched, without notches, having a vertical sharp crest. Fig. 146.

In the warm and humid parts of America. Several pairs lay in a common nest.

10. *RAMPHASTOS*, *Lin.* TOUCANS.

Beak enormous, almost as thick and as long as their body, slight and cellulous interiorly, arched towards the end, irregularly notched at the lateral edges.

Tongue long, narrow, and furnished with barbs on each side, like a feather.

Warm parts of America.

a. R. PROPER.

Beak larger than the head. Fig. 147.

b. PTEROGLOSSUS, *Illig.*
ARACARI.

Beak less than the head, covered with a less solid horn. Fig. 148.

11. PSITTACUS, *Lin.* PAR-
ROTS.

Beak large, hard, solid, rounded entirely, encircled at its base by a membrane wherein the nostrils are pierced. (1).

Tongue thick, fleshy, and rounded.

The torrid zone of both continents, but even every large island has its peculiar species, their wings not enabling them to cross any extent of sea.

Tail graduated.

a. ARAS.

Cheeks naked of feathers.

America.

b. PARRAKEETS.*α.* PARRAKEET ARAS.
Vaill.

Circle around the eye naked.

β. ARROW-TAILED PAR-
RAKEETS.

The two middle pen-
feathers much longer
than the others.

γ.

Tail enlarged to-
wards the end. (2)

δ. PARRAKEETS PRO-
PER, *Vaill.*

Tail almost equally
graduated.

Tail long.

(1) This membrane and the form of their tongue, give them great facility in imitating the human voice. Their inferior larynx is very complicated, and furnished with three peculiar muscles on each side, which also contributes to the above faculty; their powerful jaws are put in action by a greater number of muscles than those of other birds. Their intestines are very long and they have no cæcum.

(2) The name of *Loris* has been given to those species the ground of whose plumage is red.

Tail short and square.	c. COCKATOOS.		
	α	A crest of long narrow feathers, ranged in 2 lines and raised or lowered at will. Fig. 149.	The more remote parts of India.
	β .	Crest more simple, less moveable, and composed of large feathers of moderate length.	New-Holland : live on roots.
	γ .	Pendent feathers, with fine barbs towards the end, instead of a crest.	
	δ .	No crest.	
	d. PARRAKEETS WITH TRUNKS, <i>Vaill.</i>		
	Cheeks naked ; the upper mandible enormous, the lower very short and unable to close entirely. Tongue cylindrical, terminated by a small horny gland, cleft at the end and elongating considerably. Fig. 150.	Crest of long and narrow feathers. Tarsi short and flat, rested on when walking. Fig. 150.	East-Indies.
	e. PEZOPORUS, <i>Illig.</i> P. INGAMBES, <i>Vaill.</i>		
	Beak weaker.	Tarsi more elevated and nails straighter than in the other <i>Parrakeets</i> . Fig. 151.	Walk on the ground. Insectivorous. New-Holland.

- Analogous to Gallinaceæ. (1)
12. TOURACOS. Co-
RYTHAIX, *Illig.*
Beak not ascend- A crest, which they Africa.
ing on the forehead. have the power of
Fig. 153. *P. Afri-* elevating.
canus, Lath.
13. MUSOPHAGA ,
Isert. BANANA-
EATERS.
Beak forming a Ditto.
disk which covers
part of the fore-
head. Fig. 152. *M.*
violacea, Lath.

(1) They have the wings and tails of the *Hoccos*; their beak is short, the upper mandible swelled, and there is a short membrane between the front toes, but the *exterior toe is often directed backwards*; their nostrils are *simply pierced in the horn of their beak*, the edges of the mandible are dentated, and the sternum, at least that of the *Touraco*, has not the great notches ordinarily found in the *Gallinaceæ*.

ORDER IV.

Gallinaceæ,

So named from their affinity to the domestic Cock, like which they have, generally, the anterior toes united at their base by a short membrane, and notched along their edges; the upper mandible vaulted; the nostrils, pierced in the large membranous space at the base of the beak, covered by a cartilaginous scale; the gait heavy; the sternum diminished by two notches, so broad and deep that they occupy almost the whole of its sides, its crest terminating obliquely in front, so that the sharp point of the furcula is only joined to it by a ligament (Fig. 167.); all which circumstances, by weakening their pectoral muscles considerably, render their flight difficult. Their tail has mostly 14 and sometimes even 18 pen-feathers, with the exception of the *Alectors*. Their inferior larynx is very simple, consequently none of them sing agreeably; they have a very wide crop and a very powerful gizzard. Excepting the *Alectors*, they lay and hatch their eggs on the ground, on heaps of straw or grass rudely scattered. Each male has generally several females, and does not interfere either with the nest or the care of the young, which are generally numerous, and, most frequently, able to run on coming out of the shell.

This very natural family, remarkable for having given us the greater part of our farm-yard fowls and much excellent game, can only be divided into *genera* by some unimportant characters taken from the appendages of the head.

GALLINACEÆ.

GENERA AND SUB-GENERA.

1. PAVO, *Lin.* PEACOCKS.

The *tectrices* of the tail, in the male, longer than the pen-feathers, rise and spread. Brought from the north of India by Alexander.

a. P. PROPER.

Egrets.

Spots like eyes in the extremities of the feathers.

b. POLYPECTRUM, Tem.

Crests.

Spots of the *tectrices* of the tail (less elongated) double, and, like those of the *scapularies*, in the form of mirrors.

Tarsi of the males with two spurs.

2. MELEAGRIS, *Lin.* TURKIES.

The head and upper part of the neck covered with a nipped skin, bare of feathers; an appendage under the throat, and another on the forehead; a pencil of hairs hanging from the bottom of the neck of the adult male.

The *tectrices* of the tail shorter and stiffer, but rise and spread like those of the *Peacock*.

From America.

3. ALECTORS, *Merrem.* CURASSOWS.

Tail with 12 penfeathers, stiff, broad, and rounded.

No spurs.

a. CRAX, Lin. HOCOS. MITOUX.

Beak strong, the base covered with a skin, sometimes of a lively colour, in which the nostrils are pierced. Fig. 168. *C. globicera*.

A crest of round, long, narrow feathers, curling from the base.

America.

b. PAUXI. OURAX, Cuv.

Beak shorter and stronger. Fig. 169.

Base of the beak, and the greater part of the head, covered with short velvet-like feathers.

c. PENELOPE, Merrem. GUANS OR QUANS. JACOOS.

Beak thinner than *Crax*. Fig. 171. *P. cristata*.

Circle around the eye naked, as well as the lower part of the throat.

Tracheal artery descends, under the skin, behind the posterior edge of the sternum.

d. ORTALIDA, Merrem.
PARRAKAS.

Scarcely any of the circle around the eye, or of the throat, naked. Tracheal artery descends towards the abdomen.

e. SASA. HOAZIN, Buff.
OPISTHOCOMUS, Hof-
man. CRESTED PHEA-
SANTS.

Beak of the *Pauxis*.

Crest of long, narrow, fine feathers.

No membrane between the base of the toes.

4. SATYRUS. NAPAULS.

Males with a horn be-
hind each eye. Fig. 173.

A large, loose, nak-
ed, extensible bag, un-
der the throat.

Tarsi with spurs, in
both sexes.

5. PHASIANUS. PHEA-
SANTS.

Cheeks partly bare
(or the circle around
the eye) and with a red
skin.

a. GALLUS. COCKS. (1)

A fleshy and vertical
crest; lower mandible
with fleshy gills on each
side.

14 pen-feathers to the
tail, rising in 2 vertical
planes.

b. PHASIANUS PROPER. (2)

Tail long, graduated;
the pen-feathers forming
2 culminating planes.

c. CRESTED PHEASANTS.

Egrets. Fig. 172. *P.*
ignitus.

The lower edge of the
naked skin of the cheeks
projecting like gills.

Tail of *Gallus*; strong
spurs.

(1) Amongst the wild species are, the *G. Sonneratii*, in which the feathers of the neck of the male expand towards the base in three successive disks of a horny matter (Fig. 170); the *G. Bankiva*, Tem., which has the crest dentated like the preceding, with long pendent feathers of a golden red on the neck; the *Phas. varius* with an entire crest and a small dew-lap, without lateral gills, under the throat.

(2) The *P. pictus* and *P. Nycthemerus* are from China; the *P. Argus* from the south of Asia.

d. LOPHOPHORES, Tem.

Beak long, strong, curved, broad at the base; the superior considerably exceeding the inferior mandible, which is hidden. Fig. 174, *bis. L. Cuvieri, T.*

Egrets.

Tail ordinary; strong spurs.

e. CRYPTONYX, Tem.

Only the circle around the eye naked. Fig. 175. Great toe without a nail. Fig. 175.

Tail ordinary; no spurs.

6. NUMIDA, *Lin.* PINTADO.

Head naked, generally surmounted with a callous crest. Fig. 176. *N. meleagris.*

No spurs. Tail short, pendent. From Africa.

7. TETRAO, *Lin.* GROUS.

A naked band (generally red) in the place of the eye-brow.

a. TETRAO, Lath.

Toes naked. Fig. 178. *T. Urogallus.*

Tarsi covered with feathers, and without spurs.

Tail round or forked.

b. LAGOPUS, Briss.

Toes covered.

Generally become white in winter.

Tail round or square.

c. PTEROCLES, Tem. GAVCA. ATTAGEN.

Toes naked.

Circle of the eye naked, but not red. Great toe very small. Fig. 177.

Tail pointed.

d. PERDIX, Briss. PARTRIDGES.

Toes naked.

Tarsi naked.

α. FRANCOLINES.

Beak longer and stronger. Fig. 181.

Spurs stronger.

Tail more developed.

β. PERDIX PROPER.

Beak weaker. Fig. 182.

Spurs short or simple tubercles in the males, wanting in the females.

e. COTURNIX. QUAILS.

Less than the *P. Proper*. Beak more slender. Fig. 184.

No spurs; band above the eye whitish.

Tail shorter. Emigrate across the Mediterranean.

f. COLINS. AMERICAN QUAILS.

Beak larger, shorter, more swelled. Fig. 183.

Tail more expanded.

8. TRIDACTYLES, *Lacép.*
HEMIPODIUS, *Tem.*

Beak compressed, swells a little under the lower mandible.

No great toe.

Polygamous. In sandy countries. Anatomy not sufficiently known to class them with certainty.

a. TURNIX, *Bonnat.* ORTYGIS, *Illig.*

Toes separated to the base, and without the small membranes. Fig. 185.

Gait of quails.

b. SYRRHAPTES, *Illig.*

Wings extremely long and pointed. Fig. 186. *T. paradoxus*.

Tarsi and toes feathered, the former short, the latter very short and united in a part of their length.

Differ considerably from the type of the *Gallinaceæ*.

9. TINAMUS, *Lath.* CRYPTURUS, *Illig.* YNAMBUS, *Azz.*

Beak long, slim, blunt at the end, with a small furrow on each side; the nostrils pierced in the middle, and penetrating obliquely backwards. Fig. 187.

Neck slender, elongated, covered with feathers with fine barbs and frizzed at the ends.

Scarcely any tail; wings short; the great toe, reduced to a small spur, cannot touch the ground.

America.

10. COLUMBA, *Linnæus.*
PIGEONS.

Beak of *Gallinaceæ*.

No distinct membranes between the bases of the toes.

Tail with 12 penfeathers.

a. COLUMBI - GALLINES ,
Vaill.

Beak slim, flexible. Tarsi more elevated. Seek their food on the
 Fig. 179. *C. carunculata.* Fig. 179. ground. Live in troops.

b. DOVES.

Ditto. Tarsi shorter.

c. COLOMBARS, *Vaill.* VIR-
 NAGO, *Cuv.*

Beak larger, solid, Tarsi short ; feet wide Frugivorous.
 compressed at the sides. and well edged. Fig. 180. The great woods of
 Fig. 180. *C. Abyssinica.* the torrid zone of the
 Old World.

ORDER V.

Grallæ.

The *Grallæ*, *Shore-Birds* or *Waders*, take their name from their habits and the formation which gives rise to them. We recognise them by the nudity of the lower part of their thighs, and very frequently by the length of their tarsi, which circumstances enable them to enter the water to some depth without wetting their plumage, and to wade and fish in it by means of their neck and beak, both of which are of a length proportionate to their legs. Those with strong beaks live on fish or reptiles; those whose beaks are weaker, on worms and insects. A few partly content themselves with grains and herbage, and these only live far from the water. The exterior is most frequently united at its base to the middle toe, by means of a short membrane; sometimes there are two similar membranes, at others they are entirely wanting and the toes are separate; rarely, they are bordered all along or palmated to the end; lastly, the great toe is wanting in several Genera: all which circumstances render their mode of life more or less aquatic. Almost all these Birds, if we except the *Ostriches*, have long wings and fly well. They extend their legs behind when they fly, contrary to other Birds, who fold them under the belly.

FAMILIES.

1. BREVIPENNES.

Wings too short for flight.	Pectoral muscles very slight, but those of the legs and thighs enormous.	No carina to the sternum.
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2. PRESSIROSTRES.

Beak moderate. Fig. 189.	Legs elevated; great toes too short to reach the ground, or none.
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3. CULTIROSTRES.

Beak large, long, strong, generally with sharp edges, and pointed. Fig. 199.

4. LONGIROSTRES.

Beak slim, long, and weak. Fig. 208.

5. MACRODACTYLA.

Beak more or less compressed, never so slim or weak as in the *Longirostres*. Fig. 222. Toes very long, but no membranes between the bases. Fig. 222. Body flattened from the narrowness of the sternum. Wings moderate or short; flight feeble.

6. GLAREOLA, Gm. PRATINCOLES. SEA PARTRIDGES.

Beak short, conical, entirely arched, somewhat cleft. Fig. 224. Tarsi plated, exterior toes a little pal- mated, great toe touching the ground. Wings exceedingly long and pointed.

The description of the *Family* is that of the only *Genus*.

7. PHŒNICOPTERUS, Lin. FLAMINGOS.

Neck as slim and as long as their legs; head small; the inferior mandible oval, bent longitudinally in a demi-cylindrical canal; the superior mandible oblong and flat, bent transversely in the middle to join the other exactly. Fig. 220. Legs excessively long, 3 front toes pal- mated to the end, the great toe extremely short. The five transversal plates which edge their mandibles, and the fleshy thickness of their tongue, approximate them to the *Anas*. In all parts of the world, from lat. 40° to 45°.

The description of the *Family* is that of the only *Genus*.

FAMILY I. BREVIPENNES.

GENERA AND SUB-GENERA.

1. STRUTHIO, Lin. OSTRICHES.

Beak depressed horizontally, of moderate length, blunt at the end; tongue short, and rounded like a crescent; eyelids with hairs. Wings covered with loose flexible feathers, and long enough to accelerate their course. An enormous crop, and a considerable ventricle between the crop and the gizzard. Cæcum long, and a vast cloaca wherein the urine accumulates.

a.

From 6 to 8 feet high.

2 toes; and the exterior, one half shorter than the other, without a nail.

Eggs nearly 3lbs. weight.
Africa.b. RHEA, *Lath.*

From 3 to 4 feet high.

3 toes, all with nails.

America.

2. CASUARIUS, *Briss.* CAS-
SOARS. CASSOWARIES.Wings shorter, and
useless in their course.3 toes, all with nails;
the barbs of their fea-
thers resembling horse-
hair.

a.

Beak compressed la-
terally.Head surmounted with
a bony prominence co-
vered with a horny sub-
stance.Nail of the inner toe
much the largest.
Indian Archipelago.

b.

Beak depressed.

No casque. (1)

Nails equal.

FAMILY II. PRESSIROSTRES.

GENERA AND SUB-GENERA.

1. OTIS, *Lin.* BUSTARDS.Beak moderate, the su-
perior mandible slightly
arched and vaulted. Fig.
193. *Otis tarda.*Very small webs be-
tween the bases of the
toes.Tarsi reticulated,
wings short, feet and
neck long; fly but lit-
tle.2. CHARADRIUS, *Linn.*
PLOVERS.Beak moderate, com-
pressed, enlarged at the
end. Fig. 223.

No great toe.

(1) The Genus *Didus* (*Dodo*) of Latham, comprehends the *D. Ineptus*, a species which has disappeared, but a head of which, much injured during a lapse of 150 years, is preserved in the Ashmolean Museum, at Oxford (Fig. 188), and a foot in the British Museum (Fig. 188); the *D. Solitarius*, which rests on the single testimony of Leguat, who has disfigured even the Lamantin, Hippopotamus and other well-known animals; the *D. Nazarenus*, seen by Cauche only, who, stating that it has 3 toes, considers it to be the same as the *D. Ineptus*, which has 4.

a. OEDIGNEMUS, *Cuv.*

End of the beak enlarged above and below. Fig. 190.

Nasal canal extending only one half the length of the beak.

Feet reticulated.
Dry, stony soils.

b. CHARADRIUS PROPER.

End of the beak enlarged above only. Fig. 189.

Nasal canal extending two-thirds the length of the beak.

3. TRINGA, *Lin.*

Beak of the *Plovers*.

Great toe so small as not to touch the ground.

a. SQUATAROLA, *Cuv.*
SANDPIPERS.

Beak enlarged underneath.

Great toe scarcely perceptible; nasal canal short.

Feet *reticulated*.

b. TRINGA PROPER. LAP-
WINGS.

Great toe more evident; nasal canal two-thirds the length of the beak.

Tarsi partly *plated*.

4. HÆMATOPUS, *Lin.* SEA-
PIES, OYSTER-CATCHERS.

Beak rather longer, straight, pointed, compressed in a wedge, strong enough to open bivalve shells. Fig. 194.
Hæmatopus ostrolegus.

Nasal canal deep, half the length of the beak, with the nostrils pierced in the middle like a small crack.

Tarsi *reticulated*; only 3 toes.

5. CURSORIUS, *Lac.*
TACHYDROMUS, *Illig.*

Beak more slim, equally conical, arched, without furrow, and moderately cleft. Fig. 191.

No great toe.

Legs elevated; 3 toes.

6. CARIAMA, *Briss.* MICRODACTYLUS, *Geoff.*
DICHOLOPHUS, *Illig.*

Beak large, more crook'd, cleft to below the eye. Fig. 196. *C. de Margrave.*

Great toe not reaching the ground.

Legs plated, very long; toes extremely short, a little palmated at the base.

FAMILY III. CULTIROSTRES.

GENERA AND SUB-GENERA.

1. GRUS, *Cuv.* CRANES.

Beak straight, but little cleft; the membranous nasal canal, broad and concave, occupies half the length. Legs plated; the great toe scarcely reaching the ground.

a. PSOPHIA, *Lin.* AGAMIS.
TRUMPETERS.

Beak short.

Head and neck covered with down only, circle around the eye naked.

Granivorous and frugivorous.
From America.

b. NUMIDICÆ. NUMIDIAN
CRANES.

Beak shorter. Fig. 199. *Ardea Pavonia*, *L.*

Africa.

c. GRUS PROPER.

Beak as long and longer than the head.

§ *More carnivorous; beak stronger; toes larger.*

2. CANCROMA, *Lin.* BOAT-
BILLS. SAVACOUS.

Beak resembling spoons joined by their concave sides; the superior mandible with a sharp tooth on each side of the point. Fig. 192. *C. Cochlearia.* Nostrils pierced towards the base of the beak, and prolonged in two parallel furrows towards the point. 4 toes, long, and almost without membranes. Piscivorous.

3. ARDEA, *Cuv.* HERONS.

Beak cleft to below the eyes, which are in a naked skin extending to the beak.

Nasal canal prolonged in a furrow very nearly to the point of the beak.

Legs *plated*; toes rather long, exterior webs evident. Their dung burns the trees.

a. ARDEA PROPER.

Neck very slim, with long pendant feathers at the base. Fig. 195.

b. EGRETS.

The feathers of the lower part of the back singularly long and fine.

c. BUTOR. BITTERNS.

The feathers of the neck loose and far apart.

d. BITHOREAU. NIGHT-HERONS.

Stiff slender feathers in the occiput of the adult male.

§§ Beak longer, smoother; webs, almost equal and rather thick, between the bases of the toes.

4. CICONIA, *Cuv.* STORKS.

Beak large, moderately cleft; tongue extremely short. Fig. 202.

No nasal canal or furrow; nostrils pierced towards the base of the beak.

Legs *reticulated*.— Make a clapping noise with their mandibles.

5. MYCTERIA, *Lin.* JA-BIRU.

Beak slightly curved in the upper part. Fig. 203.

Ditto.

Legs *reticulated*.

6. SCOPUS, *Briss.* UMBRES.

Beak compressed, the culminating edge sharp and enlarged towards the base; the end a little crook'd. Fig. 204.

Nostrils prolonged in parallel furrows to the end of the beak.

7. **HIANS**, *Lacép.* **ANASTOMUS**, *Illig.* **OPEN-BEAKS.**

Mandibles join only at their base and points, having a void interval in the middle of their edges, appearing to be partly the effect of detrition. Fig. 205.

East-Indies.

8. **TANTALUS**, *Lin.*

Beak as *Ciconia*, but the back rounded, the point curved, and slightly notched on each side. Fig. 206.

Nostrils as *Ciconia*.

Part of their head bare.

9. **PLATALEA**, *Lin.*
SPOON-BILLS.

Beak long, flat, broad, like a spatula; tongue small. Fig. 214.

Nostrils oval, and pierced near the origin of slight furrows proceeding from the base to the end of the beak.

Legs *reticulated*.

FAMILY IV. LONGIROSTRES.

GENERA AND SUB-GENERA.

1. **SCOLOPAX.**

a. **IBIS**, *Cuv.* (1)

Beak arched, weaker than that of the *Tantalus*, without notch at the point, almost square at the base. Fig. 208. *S. Rubra*.

Nostrils pierced towards the back of the base, and prolonged in a furrow to the end.

Part of the head or neck bare; exterior toes well palmated at the base; great toe long enough to rest on the ground.

b. **NUMENIUS**, *Cuv.* **CRES-CENT-BEAKS. CURLEWS.**

Beak arched, round in the whole length, weaker, the upper end passing the lower. Fig. 213.

Furrow of the nostrils very short.

(1) M. Cuvier (*Recherches sur les Ossements Fossiles*, t. 1. p.) shews the *Ibis sacer* of the Egyptians to be the *Numenius Ibis* or *Tantalus Oethiopicus* of Latham, Fig. 209; Fig. 210 was drawn from the head of a mummy found at Thebes, and now in the Gallery of the Museum at Paris; Fig. 207 is from one of the temples in Upper Egypt.

c. PHÆOPUS, *Cuv.* WHIM-
BRELS.

Beak depressed to-
wards the end. Fig. 216.

Furrow of the nostrils
almost the whole length
of the beak.

d. FALCINELLUS, *Cuv.* PYG-
MY-CURLEWS.

Ditto.

Ditto.

No great toe.

e. SCOLOPAX PROPER.
WOODCOCKS. SNIPES.

Beak straight, the end
of the upper mandible
(enlarging to surpass the
lower) soft, very sensi-
ble, and drying into a
point after death. Fig.
201.

Ditto, with a simple
furrow on the *lower*
mandible.

Head compressed; eyes
large and very far back.

f. RYNCHOEA, *Cuv.*

Mandibles nearly e-
qual, arched slightly at
the ends. Fig. 197.

Ditto, but no furrow
on the lower mandible.

Spots, like eyes, on the
pen-feathers of the wings
and tail.

Africa. India.

g. LIMOSA, *Bechst.* GOD-
WITS.

Beak straight, or slight-
ly arched towards the
upper part; the end de-
pressed and blunt. Fig.
200.

Ditto.

Form more slender and
legs longer than in the
Scolopax.

h. CALIDRIS, *Cuv.* SAND-
PIPERS. KNOTS.

Beak depressed at the
end, not longer than the
head.

Ditto.

Toes slightly border-
ed, without webs at their
base; great toe scarcely
long enough to reach the
ground (Fig. 221), gait
and form heavy.

i. PELIDNA, *Cuv.* PURRES.
STINTS. SEA-LARKS.

Beak of *Calidris*, but
a little longer than the
head.

Ditto.

Toes without borders
or webs.

k. MACHETES, Cuv. RUFFS
and REEVES. COM-
BATANTS.

Beak and gait of *Calidris*.

Web between their ex-
terior toes as large as in
the *Limosa*.

Feet yellowish.

l. ARENARIA, Bechst. CA-
LIDRIS, Illig. CUR-
WILLETS.

Ditto.

No great toe.

m. PHALAROPUS, Briss.

Beak flatter than in
the *Calidris*, the fur-
rows the same. Fig. 198.

Toes edged with very
large membranes, like
the *Fulicæ*.

n. STREPSILAS, Ill. TURN-
STONES. SEA-DOTTRELS.

Beak conical, pointed,
not depressed; nasal ca-
nal half the length. Fig.
217.

Great toe scarcely
touches the ground.

o. TOTANUS, Cuv. SNIPES.
SAND-PIPERS. HORSE-
MEN.

Beak slim, round,
pointed, furrow of the
nostrils half the length;
the upper mandible a
little arched towards the
end. Fig. 219. *S. glottis*.

Ditto.

Exterior web very evi-
dent.

p. LOBIPES, Cuv.

Ditto.

Toes of *Phalaropus*.

q. HIMANTOPUS, Briss.
MACROTARSUS, Lac.
LONG - LEGGED PLO-
VERS.

Beak of *Totanus*, but
more pointed.

No great toe.

Legs excessively slim
and long, reticulated,
and the bones so weak
as to render their walk
painful. Fig. 212.

2. RECURVIROSTRA, Lin.
AVOSETS.

Beak long, slim, point-
ed, smooth, elastic, *with*
a strong curve upwards.
Fig. 215.

Great toe much too
short to reach the
ground.

Legs reticulated,
tarsi elevated.

FAMILY V. MACRODACTYLA.

GENERA AND SUB-GENERA.

§ *Wings armed with spurs.*1. JACANA, *Briss.* PAR-
RA, *Lin.*

Beak moderately long, slightly enlarged at the end. Fig. 222.	One spur to each wing. Four toes, very long, separated to the roots; the nails, especially that of the great toe, very long and pointed. Fig. 222.	Marshes of warm climates.
---	--	---------------------------

2. PALAMEDEA, *Lin.* KA-
MICH. SCREAMERS.

Beak little cleft and compressed, not enlarged, and the superior mandible slightly arched. Fig. 218. <i>P. cornuta.</i>	Two strong spurs to each wing. Toes without webs, nails strong, that of the great toe straight. Fig. 218.	Legs reticulated.
---	---	-------------------

§§ *Wings unarmed.*3. RALLUS, *Lin.* RAILS.

Beak without frontal plate.

a. RALLUS, Bechst.

Beak longer. Fig. 225.

b. CREX, Bechst.

Beak shorter. Fig. 226.

4. FULICA, *Lin.*

Beak with a frontal plate covering the forehead.

- a. GALLINULA, *Briss* and
Lath. WATER-FOWLS.
 Fig. 211.

Border of the toes nar-
 row.

- b. PORPHYRIO, *Briss.* SUL-
 TANS.

Beak deeper in pro- Border of the toes
 portion to its length; scarcely evident.
 frontal plate consider-
 able.

- c. FULICA PROPER, *Briss.*
 COOTS.

Beak short. Border of the toes wide
 and festooned.

ORDER VI.

Palmipedes,

Are strongly characterised by their feet formed for swimming, that is, set in the hinder part of their body (Fig. 1), with very short and compressed tarsi, and palmated between the toes.

Their close, glossy plumage, imbued with an oily juice and furnished with a thick down next the skin, protects them from the water on which they live. They are the only Birds in which the length of the neck exceeds (sometimes considerably) that of the feet (Fig. 1), having frequently to fish in the depth whilst they swim on the surface of the water. Their sternum is very long, protects the greatest part of their viscera, and has but one notch on each side, or an oval hole furnished with membranes. Their gizzard is generally muscular, their cœcums long, and the inferior larynx simple, with the exception of one Family, in which it is swelled into cartilaginous capsules.

FAMILIES.

1. BRACHYPTERES.

Legs further back than any of the following, making their walk very painful, and obliging them to preserve a vertical position. Fig. 229.

Wings *exceedingly short*; fly very ill, or not at all.

Plumage very close, and offering a smooth and shining surface; swim under water, using their wings as fins: a peculiar muscle on each side of the lower larynx: cœcum moderate.

2. LONGIPENNES.

Beak, without notches, crook'd at the end, or simply pointed.

Wings *very long*; flight extensive. *Great toe free or none.*

Only one muscle on each side of the inferior larynx: cœcums short.

3. TOTIPALMES.

Great toe united with the others in a single membrane. Feet short; perch on trees.

4. LAMELLIROSTRES.

Beak thick, covered with a soft skin rather than a true horn; the edges with plates or small teeth. Fig. 251.

Wings moderate.

Tracheal artery of the male generally expanded near the bifurcation into capsules of different forms: cœcum long.

FAMILY I. BRACHYPTERES.

GENERA AND SUB-GENERA.

1. COLYMBUS, *Lin.*

Beak smooth, straight, compressed, pointed; nostrils linear.

a. PODICEPS, Lath. COLYMBUS, Briss. and Illiger.

Toes enlarged (like those of the *Fulicæ*) instead of true webs, those in front united, at the base only, by membranes. Fig. 227, *bis*.

Middle nail flattened; tarsi compressed.

Plumage, of a metallic lustre, frequently used as fur.

b. COLYM. PROPER, Lath. MERGUS, Briss. EUDYTES, Illig. DIVERS.

Feet of *Palmipedes* in general, that is, the front toes united (to the ends) by membranes, and terminated by pointed nails.

Northern Birds, visiting our latitudes only in winter.

c. URIA, Briss. and Illig. GUILLEMOTS.

Beak with feathers to the nostrils, and notched at the point, which is a little arched. Fig. 230.

No great toe.

Wings still shorter than in the *Colymbus*. In steep rocks.

d. CEPHUS. GREENLAND-PIGEONS.

Beak shorter, with its back more arched, without notch; symphysis of the lower mandible extremely short. Fig. 228.

Membranes of the toes rather deeply notched.

Wings stronger.

2. ALCA, *Lin.*

Beak much compressed, elevated vertically, the back sharp, generally furrowed transversely.	Feet entirely pal- mated; no great toe.	Northern seas.
---	--	----------------

a. FRATERCULA, *Briss.*
MORMON. *Illig.* AUKS.

Beak, shorter than the head, as deep and deeper at the base than long. Fig. 231.	Nostrils (narrow clefts) near the edge.	Small wings, supporting them for a moment. Live on the sea, nest in rocks.
--	---	---

b. ALCA, *Cuv.* PENGUINS.

Beak more elongated, like the blade of a knife. Fig. 233.	Feathers as far as the nostrils.	Wings too small to sustain them, therefore do not fly at all.
---	----------------------------------	---

3. APTENODYTES, *Forst.*

Feet, more backward than in any other Birds, only afford support by resting on the tarsus, which is enlarged like the sole of the foot of a quadruped; its interior presenting three bones, soldered together at the extremities. Fig. 229.	Great toe small, directed inwards; the three anterior toes united by an entire membrane.	Wings with only vestiges of feathers, like scales.
---	--	--

a. APTENODYTES, *Cuv.* PATAGONIAN PENGUINS.

Beak slim, long, pointed; the superior mandible a little arched towards the end. Fig. 236.	Feathers covering one third the length of the beak or to the nostrils.	Furrow from the nostrils to the end of the beak.
--	--	--

b. CATARRHACTES, *Briss.*

Beak strong, little compressed, pointed, the back rounded, the point a little arched. Fig. 232.		Furrow from the nostrils terminating obliquely at the edge of the beak.
---	--	---

c. SPHENISCUS, *Briss.*

Beak compressed, Nostrils in the middle,
 straight, irregularly fur- not covered.
 rowed at the base, the
 end of the upper man-
 dible crook'd, that of the
 inferior truncated. Fig.
 234.

FAMILY II. LONGIPENNES.

GENERA AND SUB-GENERA.

1. PROCELLARIA, *Lin.*

Beak crook'd at the Nostrils united in a A nail on the heel,
 end, the extremity hav- tube on the back of the instead of a great
 ing the appearance of a superior mandible. toe. (1)
 piece articulated to the
 rest.

a. P. PROPER. PETRELS.

Inferior mandible
 truncated. Fig. 240.

b. PUFFINUS, *Briss.* PUF-
FINS.

End of the inferior Nostrils not opening
 mandible curves down- by a common orifice, but
 wards with that of the by two distinct holes.
 upper; beak more elon-
 gated. Fig. 235.

c. PELECANOIDES, *Lacép.*
HALODROMA, *Illig.*

Ditto.

Throat dilatable; no
 great toe.

d. PRIONS, *Lacép.* PACHYF-
TILA, *Illig.*

Beak enlarged at the Ditto.
 base, the edges furnish-
 ed with plates like the
Anas. Fig. 259, *bis*.

(1) They remain a longer time at sea than any of the other *Palmipedes*, and are often obliged, when a storm approaches, to fly to vessels for refuge: they make their nests in the holes of rocks and shoot an oily juice, of which their stomach appears to be always full, at those who attack them.

2. DIOMEDEA, *Lin.* AL-
BATROSSES.

Beak large, strong, sharp, with distinct sutures, and terminated by a crook seemingly articulated. Fig. 257.	Nostrils, like rolls, short, on the sides of the beak.	No great toe or nail in place of it. The most massive of all the <i>Palmipedes</i> . Austral seas.
--	--	---

3. LARUS, *Lin.*

Beak compressed, elongated, pointed; the superior mandible arched towards the end; the inferior forming a projecting angle underneath.	Nostrils, towards the middle, long, narrow, open.	Great toe short. (1)
--	---	----------------------

a. GOELANDS. GULLS.

Larger than *Ducks*.
Fig. 237.

b. MAUVES. SEA-MEWS.

Less than *Ducks*.

c. STERCORAIRES, *Briss.*
LABBES, *Buff.* LES-
TRIS, *Illig.*

Nostrils membranous, and the orifices nearer the point and edge of the beak. Fig. 242.	Tail pointed. (2)
--	-------------------

4. STERNA, *Lin.* SEA-
SWALLOWS.

Beak pointed, compressed, straight, without curve or projection; nostrils towards the base, oblong and pierced interruptedly. Fig. 238.	<i>Wings extremely long and pointed.</i>	Membranes, uniting the toes, much notched; feet small.
---	--	--

(1) They feed on all kinds of fish, the flesh of dead bodies, etc. : when they fly inland it is a sign of bad weather.

(2) They pursue the small *Sea Mews* with inveteracy, to deprive them of their food, and, as some say, to devour their dung.

a. NODDIES.

A slight projection under the beak. Tail, not forked, almost as long as the wings.

b. TERNS.

Tail forked.

5. RHYNCHOPS, *Lin.* CUTWATERS. SKIMMERS.

The inferior mandible of the beak much longer than the other, and both flattened in simple plates. Fig. 243. *R. Nigra*. Wings long; tail forked. Feet small. Subsist on what they snatch from the surface of the water with their lower mandible during their flight.

FAMILY III. TOTIPALMES.

GENERA AND SUB-GENERA.

1. PELECANUS, *Lin.*

Skin of the throat more or less dilatable. Tongue very small. A space, at the base of the beak, bare of feathers; nostrils like cracks, with the openings scarcely evident.

a. ONOCROTALUS, *Briss.*
PELECANUS, *Illig.* PELICANS.

Beak extremely long, straight, broad, and flattened horizontally, terminated by a crook. Fig. 246. The inferior mandible sustaining a naked membrane, dilatable into a large bag; 2 furrows, the length of the beak, hiding the nostrils. Circle of the eyes marked like the throat; tail round.

b. PHALACROCORAX, *Briss.*
CARBO, *Meyer.* HALIEUS, *Illig.* CORVORANTS.

Beak elongated, compressed, the end of the upper mandible crook'd, that of the lower truncated. Fig. 245. Tongue very small, skin of the throat less dilatable, the nostrils like a fine line imperceptibly pierced. Corvorants. Nail of the second toe notched like a saw.

c. FRIGATE-BIRDS. MEN
OF WAR BIRDS.

Both mandibles curved at the end. Fig. 244. Tail forked, the feet short, membranes deeply notched. (1) *Envergure excessive.*

d. SULA, *Briss.* DYSPORUS,
Illig. BOOBIES. SOLAND
GEESE.

Beak straight, slightly compressed, pointed, the point a little arched (fig. 1), the edges dentated *within* like a saw. Nostrils prolonged in a line nearly to the point; the throat and the circles of the eyes naked, the former little dilatable. Nail of the middle toe notched like a saw; wings less than in the *Frigate Birds*. Tail somewhat wedge-shaped.

2. PLOTUS, *Lin.* DART-
ERS. ANHINGA.

Beak straight, slim, pointed, the edges dentated; head small. Fig. 249. Neck long. Feet like the *Cororants*.

3. PHÆTON, *Lin.* TROPIC-
BIRDS. STRAW-TAILS.

Beak straight, pointed, dentated, moderately strong. Fig. 241. Two narrow and very long feathers, like straws, in the tail. Feet short, wings long. Rarely quit the Torrid Zone.

FAMILY IV. LAMELLIROSTRES.

GENERA AND SUB-GENERA.

1. ANAS, *Lin.*

a. CYGNUS MEYER.

Beak as broad before as behind, deeper than broad at its base; neck very long. Fig. 251. Nostrils nearly in the middle of the length of the beak.

b. ANSER, *Briss.* GEESE.

Beak moderate or short, narrower before than behind, deeper than broad at its base.

(1) Their powerful wings enable them to fly immense distances from land, principally between the tropics: they dart on the *Flying-Fish* and strike the *Boobies* to make them disgorge their prey.

α. ANSER PROPER.

Beak as long as the head; the ends of the plates at the edges having the appearance of pointed teeth.

β. BARNACLES. CLAKIS.
BRAND-GEESE.

Beak shorter, slighter; the ends of the plates not visible at the edges. (1)

γ. ANAS PROPER. DUCKS.

Beak not so deep as broad at its base, and as broad (or broader) at the extremity as towards the head.

Nostrils nearer the back and base of the beak.

Legs shorter, place more backwards.

§ *Great toe bordered by a membrane.*

α. MACREUSES. SCOTERS.

Beak broad and swelled. Fig. 248.

β. GARROTS.

Beak shorter and narrower before. Fig. 250.

γ. EIDERS.

Beak narrower before, but longer than in the *Garrots* and ascending higher on the forehead, forming an angle with the feathers. Fig. 256.

δ. MILLOUINS.

Beak broad and flat. Fig. 239.

Tracheæ terminate in enlargements, forming a capsule, partly membranous, to the left, supported by bony ramifications.

§§ *Great toe not bordered.*

α. SHOVELERS.

Upper mandible bent into a demi-cylinder, enlarged at the end; the plates so long and thin as to resemble hairs. Fig. 254.

(1) The *A. Erythropus*, Gm., celebrated by the fable of its growing on the trees like a fruit (See *Grey's* notes on *Hudibras*), visits us in winter.

S. TADORNES.

Beak much flattened towards the end, raised in a projecting swell at the base. Fig. 255.

d. MERCUS, Lin. MERGANSERS. HARLES.

Beak more slim, more cylindrical, each mandible armed along its edges with little pointed teeth (like those of a saw) directed backwards. Fig. 258. *M. serrator*.

The end of the upper mandible crook'd.

The enlargement of the inferior larynx enormous and partly membranous, *in the males*. Live on ponds and lakes.

The 4 additional species of *Accipitres*, figured to fill up the last plate, are, *Cathartes vulturinus*, Tem., from New California, Fig. 260; *Vultur monachus*, Lath., or *Chincou*, from India, Fig. 261; *Strix leucotis*, Tem., from Senegal, Fig. 262; *S. ascalaphus*, Savig., from Egypt, Fig. 263.

Those who possess the '*Analysis of the Natural Classifications of Mammalia*,' will insert the following new Sub-Genus of Bats, immediately after that of *Phyllostoma*, p. 29.

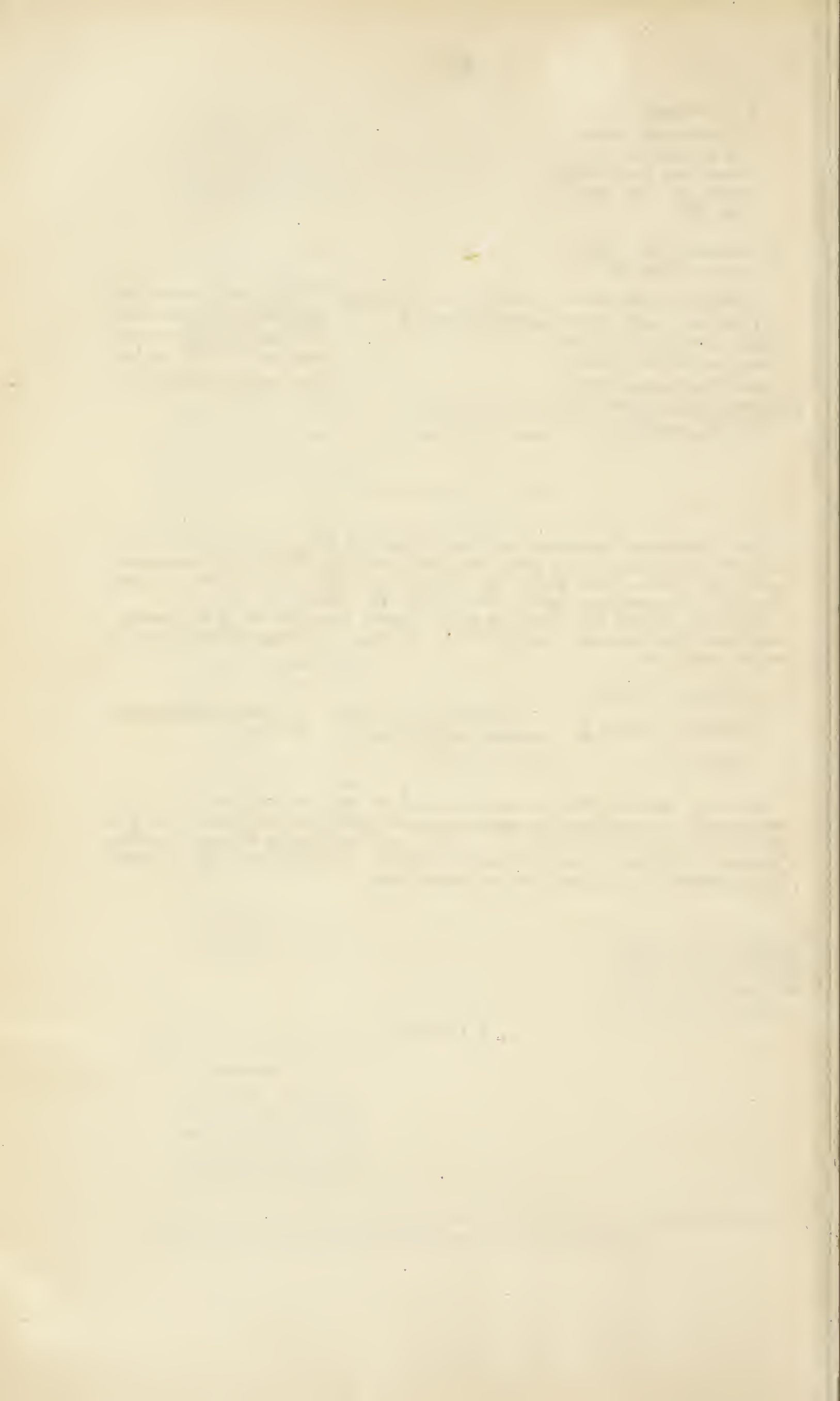
6. GLOSSOPHAGA, Geoff.

Incisives $\frac{4}{4}$ Canines $\frac{2}{2}$
Grinders $\frac{6}{6}$

The nasal crest (a single vertical leaf) at the end of the muzzle. Tongue channelled and extensible.

Sp. *Vesp. soricinus*, Pall. *G. amplexicanda*. *G. caudifer* (figured in the *Table to face* p. 12). *G. ecaudata*. The three latter were found in the neighbourhood of Rio Janeiro, by M. de Lalande.....The skull, brought by the same traveller, is that of "a *Makoca*, a people beyond the *Cassres*:" in order to preserve the facial angle precisely, it was drawn by the *Camera lucida*.

FINIS.



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INDEX TO THE ORNITHOLOGY.

	Page.		Page.		Page.
Accipitres.....	12	Bethylus.....	35	Cephalopterus.....	37
————	14	Bithoreau.....	69	Certhia.....	48
————	15	Bitterns.....	69	———— Proper.....	48
Agamis.....	68	Blackbirds.....	38	Ceyx.....	50
Aigle Autour.....	24	Boat-bills.....	68	Chaffinches.....	44
—— Pêcheur.....	24	Bombycivora.....	37	Charadrius.....	66
Alauda.....	42	Boobies.....	81	———— Proper.....	67
Albatross.....	79	Bouvreuils.....	35	Chardonnerets.....	44
Alca.....	77	Brachypteres.....	75	Chatterers.....	37
Alcedo.....	50	————	76	Choucaris.....	35
Alectors.....	59	Brevipennes.....	64	Ciconia.....	69
Ampelis.....	37	————	65	Cinclus.....	39
Anas.....	81	Bubo.....	28	Cinnyris.....	49
—— Proper.....	82	Bucco.....	53	Circus.....	21
Anastomus.....	70	—— Proper.....	54	Clakis.....	82
Anhinga.....	81	Buceros.....	50	Climbers.....	51
Anis.....	54	Budytes.....	41	Cockatoos.....	56
Anser.....	81	Bullfinches.....	44	Cocks.....	60
—— Proper.....	82	Buntings.....	43	Cocothraustes.....	44
Anthus.....	41	Buphaga.....	45	Colaris.....	47
Aptenodytes.....	77	Bustards.....	66	Colibris.....	49
Apus.....	41	Buteo.....	21	Colies.....	45
Aquila.....	21	Butor.....	69	Colins.....	62
————	24	Buzzards.....	21	Colius.....	45
Ara.....	55			Columba.....	62
Aracari.....	55	Calidris.....	71	Columbars.....	63
Ardea.....	69	————	72	Columbi Gallines.....	63
—— Proper.....	69	Callæas.....	45	Colymbus.....	76
Arenaria.....	72	Canclroma.....	68	———— Proper.....	76
Astur.....	21	Caprimulgus.....	42	Combatants.....	72
——	26	Caracara.....	25	Conirostres.....	34
—— Proper.....	26	Carbo.....	80	————	42
Attagen.....	61	Carduelis.....	44	Coots.....	74
Auks.....	77	Cariamia.....	68	Coracias.....	47
Autours.....	21	Caryocatactes.....	47	—— Proper.....	47
Avosets.....	72	Casoars.....	66	Corvorants.....	46
		Casowaries.....	66	Corvus.....	46
Balbusards.....	25	Cassicans.....	35	—— Proper.....	46
Bald-heads.....	37	————	45	Corythaix.....	57
Banana-eaters.....	57	Cassicus.....	45	Corythus.....	44
Barbacous.....	53	—— Proper.....	45	Cotinga.....	37
Barbets.....	53	Casuarus.....	66	—— Proper.....	37
Barbicans.....	54	Catarrhactes.....	47	Coturnix.....	62
Barita.....	35	Caterpillar-catchers.....	37	Couas.....	52
Barnacles.....	82	Cathartes.....	18	Coucals.....	53
Becardes.....	35	Ceblepyrus.....	37	Courols.....	53
Bee-eaters.....	50	Centropus.....	53	Cranes.....	68
Beef-eaters.....	45	Cephas.....	71	—— Numidian.....	68

INDEX TO THE ORNITHOLOGY.

	Page.		Page.		Page.
Crax	59	Falcon	16	Harpyia	24
Creepers	48	Ficedula	40	Hawks (fishing)	24
Crescent-beaks	71	Fissirostres	33	Hemipodius	62
Crex	73	—————	41	Hérons	69
Cross-bills	44	Flamingos	65	———— Night	69
Crotophoga	54	Fly-birds	49	Hians	70
Cryptonyx	61	—— Catchers	36	Hiero-falco	19
Crypturus	62	Francolines	61	Himantopus	72
Cuckows	52	Fratercula	77	Hirundo	41
———— Proper	52	Fregilus	48	Hoazin	60
———— Honey	53	Frigate-bird	81	Hoccos	59
Cuculus	52	Fringilla	43	Hoërotaria	49
Cultirostres	64	————	44	Hoopocs	48
Curassows	59	Fulica	73	Hornbills	50
Curlews	71	—— Proper	74	———— Psittaceous ..	53
———— Pygmy	71	Galbula	51	Horsemen	72
Curruca	40	Gallinaceæ	13	Humming-birds	49
Cursorius	67	————	58	Ibis	70
Curucius	54	Gallinula	74	Icterus	45
Curwillets	72	Gallus	60	Ignobiles	19
Cut-waters	80	Ganga	61	————	21
Cygnus	81	Garrots	82	Indicators	53
Cymindis	24	Garrulus	46	Jabiru	69
Cypselus	41	Geese	81	Jacamar	51
Dacnis	46	—— Brandl	82	Jacana	73
Dædalion	21	—— Soland	81	Jacoos	59
Darters	81	Glareola	65	Jays	46
Dendrocolaptes	48	Glaucopis	45	Kamichi	73
Dentirostres	33	Gnat-snappers	36	Kingfishers	50
————	34	Goat-suckers	42	Kite	21
Dicæum	48	Godwits	71	Knots	71
Dicolophus	68	Goldfinches	44	Labbes	79
Diurnæ	15	Gracula	39	Lagopus	61
————	16	Grakles	39	Lamellirostres	76
Divers	76	Grallæ	13	————	81
Dodo	66	————	64	Langrayen	34
Doves	63	Graucalus	35	Lanius	14
Drongo	38	Griffon	16	——	34
Ducks	82	Grimpeurs	13	—— Proper	34
Dysporus	81	Grossbeaks	44	Lapwings	67
Eagles	21	Grouse	61	Larks	42
—— Proper	24	Grus	68	—— Sea	71
—— Short - winged		—— Proper	68	Lavandieres	41
fishing	24	Guans	59	Lestris	79
Echassiers	13	Guillemots	76	Limosa	71
Edolius	38	Gymnocephalus	37	Linaria	44
Egrets	69	Gymnoderes	38	Linnets	44
Eiders	82	Gypaëtos	16	Lobipes	72
Elanus	26	————	18	Longipennes	75
Emberiza	43	Gypogeranus	22	————	78
Epimachus	48	Hæmatopus	67	Longirostres	65
Eudytes	76	Haliæus	80	Lophrophores	61
Eulabes	47	Hallætus	24	Loxia	44
Falcinelles	71	————	25	Lyre-tails	39
Falco	14	—— Proper	25	Machetes	72
——	16	Halodroma	72		
——	19	Hardbeaks	45		
		Harles	83		

INDEX TO THE ORNITHOLOGY.

	Page.		Page.		Page.
Macreuses.....	82	Ortalida.....	60	Pica.....	46
Macroactyla.....	65	Orthorynchus.....	49	Picoïdes.....	52
—————.....	73	Ortycis.....	62	Picucules.....	48
Macroterus.....	72	Ostriches.....	65	Picus.....	52
Mænura.....	39	Otis.....	66	—— Proper.....	52
Malcohas.....	53	Otus.....	28	Pigeons.....	62
Manakins.....	40	Ourax.....	59	——— Greenland...	76
Martins.....	41	Oyster-catchers.....	67	Pintado.....	61
Mauves.....	79			Pipra.....	40
Meleagris.....	59	Pachyptila.....	78	Pitpits.....	46
Men of war birds....	81	Palamedea.....	73	Pitylus.....	44
Mergansers.....	83	Palmipedes.....	13	Platalea.....	70
Mergus.....	76	—————.....	75	Ploceus.....	43
—————.....	83	Pandion.....	25	Plotus.....	81
Merops.....	49	Paradise (birds of)...	47	Plovers.....	66
Microactylus.....	68	Paradisæa.....	47	——— Long-legged..	73
Millouins.....	82	Parra.....	73	Plumatae.....	34
Milvus.....	21	Parrakas.....	60	Podarge.....	42
—————.....	26	Parrakeet.....	55	Podiceps.....	76
————— Proper.....	26	————— Aras.....	55	Pogonias.....	54
Mitoux.....	59	————— Arrow-tailed	55	Polyplectrum.....	59
Mormon.....	77	————— Proper.....	55	Porphyrio.....	74
Morphnus.....	24	————— with trunks.	56	Pratincoles.....	65
—————.....	25	Parrot.....	55	Pressirostres.....	64
Motacilla.....	40	Partridge.....	61	—————.....	66
—————.....	41	————— Sea.....	65	Prionites.....	50
Moustaches.....	43	Parus.....	43	Prions...	78
Muscicapa.....	36	——.....	43	Procellaria.....	78
—————.....	37	Passeres.....	12	————— Proper.....	78
Muscipata.....	36	—————.....	33	Procnias.....	38
Musophaga.....	57	Pauxi.....	59	Promerops.....	48
Mycteria.....	69	Pavo.....	58	Psaris.....	35
Myothera.....	39	Peacocks.....	58	Psittacus.....	55
		————— Proper.....	58	Psophia.....	68
Naked-necks.....	38	Pelecanoïdes.....	78	Pterocles.....	61
Napauls.....	60	Pelecanus.....	80	Pteroglossus.....	55
Nectarinia.....	48	Pelican.....	80	Puffins.....	78
Neophron.....	18	Pelidna.....	71	Puffinus.....	78
Nightingales.....	40	Penelope.....	59	Purres.....	71
Nisus.....	26	Penguins.....	77	Pyrgita.....	43
Nobiles.....	19	————— Patagonian.	77	Pyrrho-Corax.....	38
Noctua.....	27	Pernopterus.....	18	Pyrrhula.....	44
—————.....	29	Perdix.....	61		
Nocturnæ.....	15	————— Proper.....	61	Quails.....	62
—————.....	27	Pernis.....	21	—— American.....	62
Noddies.....	80	Petrels.....	18	Quans.....	59
Nudipes.....	29	Pezoporus.....	56		
Numenius.....	70	————— Ingambes..	56	Rails.....	73
Numida.....	61	Phæopus.....	71	Rallus.....	73
Numidiciæ.....	68	Phaëton.....	81	Rhamphastos.....	54
Nuterackers.....	47	Phalaropus.....	72	————— Proper..	55
Nuthatches.....	46	Phalacrocorax.....	80	Recurvirostra.....	72
Nyctea.....	29	Phasianus.....	60	Regulus.....	40
		——— Proper.....	60	Remiz.....	43
Ocypterus.....	34	Pheasant.....	60	Rhea.....	66
OEdicnemus.....	67	————— Crested....	60	Rhynchops.....	80
Onocrotalus.....	80	Phene.....	16	Rollers.....	47
Open-beaks.....	70	Philedon.....	39	Ruffs and Reeves....	72
Opisthocomus.....	60	Phœnicopterus.....	65	Rupicola.....	40
Oriolus.....	38	Piauhau.....	37	Rynchoca.....	71

INDEX TO THE ORNITHOLOGY.

	Page.		Page.		Page.
Sand-pipers.....	67	Sugar-eaters.....	49	Trochilus.....	49
-----	72	Sula.....	81	Tropic-birds.....	
-----	71	Sultans.....	74	Troglodytes.....	40
Sarcoramphus.....	18	Surnia.....	29	Trogon.....	54
Sasa.....	60	Swallows.....	41	Trumpeters.....	68
Satyrus.....	60	----- Sea.....	79	Turdus.....	38
Savacous.....	68	Sylvia.....	10	Turkies.....	59
Saxicola.....	40	Syrnium.....	29	Turnix.....	62
Scansores.....	13			Turnstones.....	72
-----	51	Tachydromus.....	67	Tyrannus.....	36
Scolopax.....	70	Tadornes.....	83		
----- Proper.....	71	Tamatias.....	54	Ulula.....	28
Scops.....	29	Tanagers.....	35	Umbres.....	69
Scopus.....	69	----- Cardinals... ..	35	Upupa.....	48
Screamers.....	73	----- Euphones.. ..	35	----- Proper.....	48
Scythrops.....	53	----- Grossbeaks.. ..	36	Uria.....	76
Sea-dottrels.....	72	----- Loriots.....	36		
Sea Mews.....	79	----- Proper.....	36	Vanga.....	34
Sea Pies.....	67	----- Ramphoceles ..	36	Vidua.....	44
Serpentarius.....	22	Tanagra.....	35	Virago.....	63
Shore-birds.....	64	Tantalus.....	70	Vouroudrious.....	53
Shovelers.....	82	Temia.....	47	Vultur.....	14
Shrikes.....	34	Tenuirostres.....	34	-----	16
Sitta.....	46	-----	48	-----	18
Skimmers.....	80	Terns.....	80	Vulture.....	16
Snipes.....	71	Tetras.....	61	----- Proper.....	18
-----	72	Thrushes.....	38		
Spheniscus.....	78	----- Ant.....	39	Waders.....	64
Spoon-bills.....	70	Tichodroma.....	48	Wag-tails.....	41
Squatarola.....	67	Tinamus.....	60	Wasp-eaters.....	50
Stares.....	46	Tisserins.....	43	Water-fowls.....	74
Starlings.....	46	Titmice.....	43	Water Ouzels.....	39
Stercoraires.....	79	Todies.....	50	Wattlebirds.....	45
Sterna.....	79	Todus.....	50	Weavers.....	43
Stints.....	71	Torcols.....	52	Whimbrels.....	71
Storks.....	69	Totanus.....	72	Woodcocks.....	71
Straw-tails.....	81	Totipalmes.....	75	Woodpeckers.....	52
Strepsilas.....	72	-----	80	Wrens....	40
Strix.....	14	Toucans.....	54	Wrynecks.....	52
-----	27	Touracous.....	57		
-----	28	Tridactylæ.....	52	Xanthornus.....	46
Struthio.....	65	Tridactyles.....	62		
Sturnus.....	46	Tringa.....	67	Ynambus.....	62
Sugar birds.....	49	----- Plover.....	67	Yunx.....	62

INDEX TO THE MAMMALIA.

	Page.		Page.		Page.
Agouti.....	60	Carnivora.....	24	Echimys.....	56
Amphibia.....	34	—————.....	33	Edentata.....	8
—————.....	42	Castor.....	52	—————.....	61
Anoplotherium.....	71	Cavia.....	60	————— Proper.....	64
Ant-Eaters.....	65	Cebus.....	20	Elephant.....	68
———— Spiny.....	66	————.....	21	Elephas.....	68
Antelope.....	78	Centenes.....	32	Equus ...	74
Apes.....	17	Cephalotes.....	27	Erinaceus.....	31
———— American.....	17	Cercopithecus.....	18		
———— Fox-headed.....	22	Cercoleptes.....	35	Felis.....	36
———— Howling.....	21	Cervus.....	77	————.....	41
———— Proper.....	17	Cetacea.....	8	Foumart.....	37
Arctomys.....	53	————.....	83	Fox.....	40
Arctopithecus.....	17	————.....	84		
Armadillo.....	64	Cete.....	84	Galago.....	22
Ateles.....	21	————.....	86	Galeopithecus.....	26
Auriola.....	55	Chamois.....	80	Gazel.....	80
Aye-Aye.....	53	Cheirogaleus.....	23	Genetta.....	40
		Cheiroptera.....	24	Genet.....	40
Baboons.....	18	————.....	26	Georgychus.....	56
————.....	19	Cheiomys.....	53	Giraffe.....	77
Badger.....	35	Chloromys.....	63	Glossophagus(<i>Ornitho-</i>	
Balantia.....	47	Chrysochloris.....	32	logy).....	
Balæna.....	87	Civet.....	40	Glutton (<i>Wolverine</i>).....	35
———— Proper.....	88	Coati.....	35	Guenons.....	18
Balænoptera.....	88	Cobay.....	60	Guerlinguets.....	58
Bats.....	26	Cœlogenus.....	60	Gulo.....	35
———— Common.....	27	Cricetus.....	57		
———— Ternate.....	27	Cynocephalus.....	20	Halmaturus.....	49
Bathyergus.....	53			Halicore.....	85
Bear.....	34	Dama.....	81	Hamsters.....	57
Beaver.....	52	Daman.....	72	Hapale.....	17
Bimana.....	7	Dasyprocta.....	60	Hares.....	59
————.....	9	Dasyurus.....	46	Hedge-hog.....	31
————.....	11	Dasypus.....	64	Helamys.....	53
Bison.....	83	Deer.....	77	Herbivora.....	84
Bos.....	78	Delphinus.....	86	————.....	85
Bradypus.....	62	———— Proper.....	86	Herpestes.....	40
Bubalus.....	80	Delphinaptera.....	86	Hippopotamus.....	70
Buffalo.....	83	Desman.....	31	Hog (<i>Water</i>).....	60
		Dicotylus.....	71	Honio.....	11
Cabiai.....	60	Didelphis.....	25	Hyæna.....	36
Cachalot.....	87	————.....	45	————.....	41
Camelus.....	77	———— Proper.....	46	Hydromys.....	57
Camel.....	77	Digitigrada.....	33	Hydrochærus.....	60
———— Peruvian.....	77	————.....	36	Hyperoodon.....	86
Camelopardalis.....	77	Dipus.....	57	Hypsyprymnus.....	48
Canis.....	36	Dormouse.....	56	Hypudæus.....	56
————.....	38	Dugong.....	85	Hyrax.....	72
————.....	40			Hystrix.....	59
Capra.....	78	Echidna.....	66		

INDEX TO THE MAMMALIA.

	Page.		Page.		Page.
Ichneumon	40	Mustela.....	37	Pongo.....	18
Indris.....	22	—— Proper.....	37	Porcupine.....	59
Insectivora.....	24	Mycetes	21	Porpoise.....	87
————	31	Mygale.....	31	Potto.....	35
		Myoxus.....	56	Proboscidea.....	67
Jerboa.....	57	Myrmecophaga.....	65	————	68
				Procyon	34
Kanguroo.....	49	Nanguer.....	81	Pteromys.....	59
—— Rat.....	48	Narval.....	87	Pteropus.....	27
Kinkajous.	35	Nasua	35	————	28
Koala	49	Noctilio.....	28	Putorius.....	37
		Nyctinoma.....	28		
Langomys	59	Nycteris	30	Quadrumana.....	7
Lama	77	Nylgau	81	————	16
Lamantin.....	85			————	17
Lemming.....	56	Ondatra	56		
Lemur.....	17	Opossum	46	Raccoon.....	35
——	22	Orangs	17	Rat	57
—— Flying.....	26	——	19	—— Spiny.....	56
Lepus	59	Ornithorynchus.....	66	Rhinoceros.....	71
—— Proper.....	59	Oryctecopus.....	65	Rhinolophus.....	29
Lichanotus.....	22	Oryx	80	Rhynopoma.....	30
Loir.....	56	Otaries.....	44	Rodentia	7
Loris.....	22	Otolicnus....	22	——	51
Lupus.....	38	Otter.....	37	——	52
		Ovis.....	78	Roussets.....	27
Macaucos.....	20			Ruminantia.....	8
Macropus.....	45	Pacas	60	————	75
——	49	Pachydermata.....	8	————	77
Magots	19	——	67	Rytina.....	86
Makis	17	—— Proper... 67		Ryzæna.....	40
——	22	——	68		
—— Proper.....	22	——	70	Sakis.....	21
Mammoth.....	68	Palæotherium	72	Sapajoos.....	17
Manatus.....	85	Pangolin.....	65	——	20
Mandrills.....	20	Papio.....	18	—— Proper....	20
Mangoustes ..	40	Pecaris.....	71	——	21
Manis.....	65	Peccary.....	71	Sarcophaga.....	7
Marmot.....	53	Pedetes.....	53	——	23
Martin.....	37	Pedimana.....	45	——	24
Mastodon.....	68	Perameles	46	Sarigues	46
Megaderma	29	Petaurus.....	48	Satyrus.....	19
Meles	35	Phaco-Chærus.....	71	Scalops.....	31
Mephitis.....	37	Phalangista .	47	Sciurus.....	53
Mole.....	33	—— Proper... 47		——	58
Mole-Rats	52	Phascolomys	50	Seal.....	42
—— Cape	53	Phoca	42	——	74
Molossus.....	28	——	44	Shrew.....	31
Monkeys.....	18	—— Proper	44	—— Musk	31
Monstrema.....	62	Phocæna.....	86	Skunk.	37
——	66	Phyllostoma.....	29	Sloth.....	62
Monodon	87	Physeter.....	87	Solipeda.....	67
Morse	43	Pica.....	59	——	74
Moschus.....	77	Pig (Guinea)	60	Sorex.....	34
Mouffiettes	37	Plantigrada	33	Squireel.....	53
Mus.....	52	——	34	—— Flying....	59
——	55	Platypus.....	66	—— Madagascar	53
—— Proper.....	57	Plecotus.....	30	Stellera.....	86
Musk.....	77	Polatouches.....	59	Stenoderma.....	28
Mustela.	36	Pole-cat	37	Stenops.....	22

INDEX TO THE MAMMALIA.

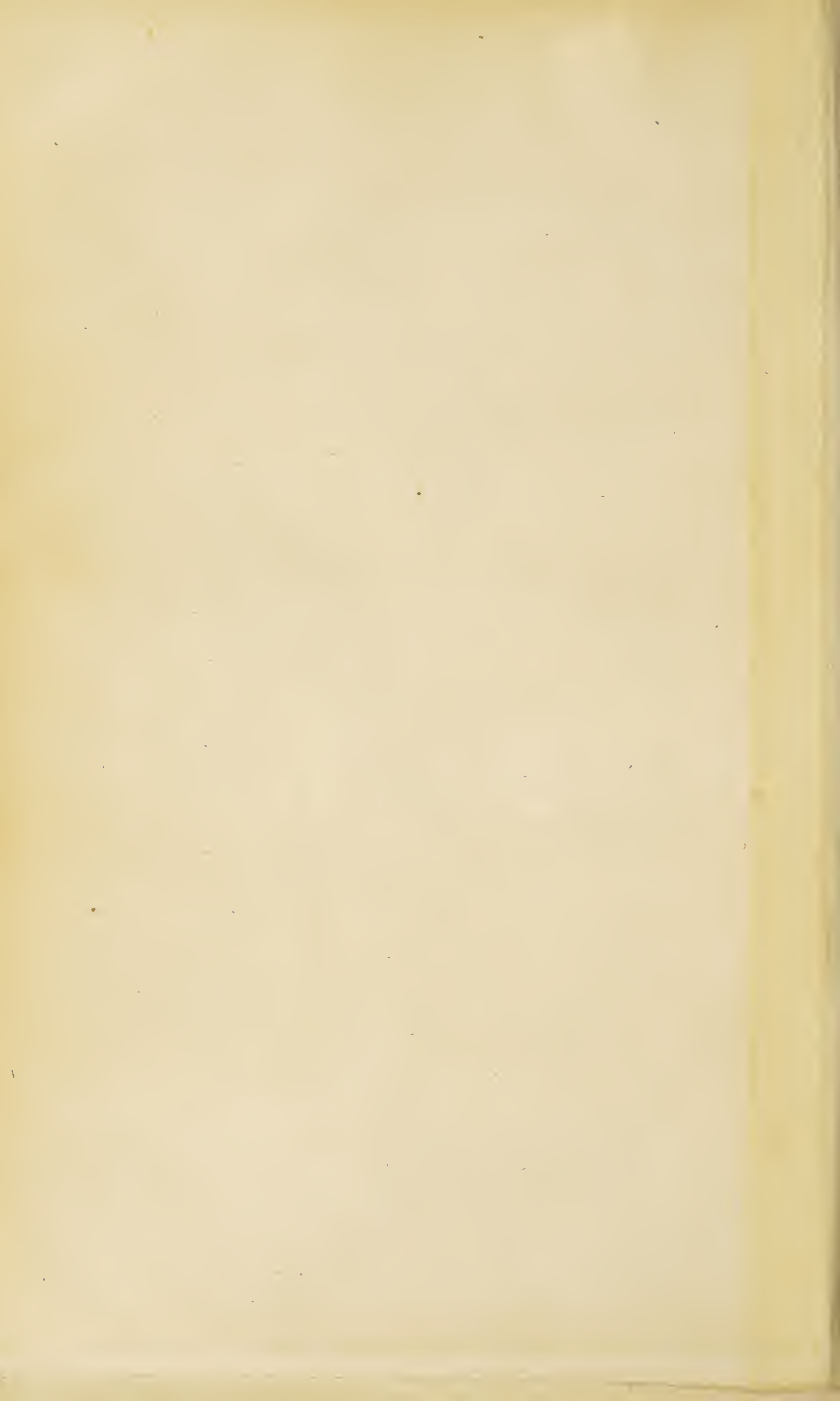
	Page.		Page.		Page.
Suricate	40	Tarsius..	22	Vespertilio Communis	30
Sus	70	Tattoo	64	———— Proper....	27
—— Proper	71	Tendrac.....	32	Viverra.....	36
Tachyglossus.....	66	Thaphozous.....	30	————	38
Talpa	33	Thylacis.....	46	————	40
Talpoides.....	52	Trichechus.....	43	———— Proper.....	40
Tamias.....	58	Troglodytes.....	19	Vulpes.....	40
Tanrec	32	Ursus.....	34	Walrus.....	43
Tapir	72	Vermiforma..	36	Weazel.....	37
Tardigrada.....	61	Vespertilio.....	26	Wistitis	17
————	62	————	27	Wombat.....	50
Tardigradus.....	22				

In the Press.

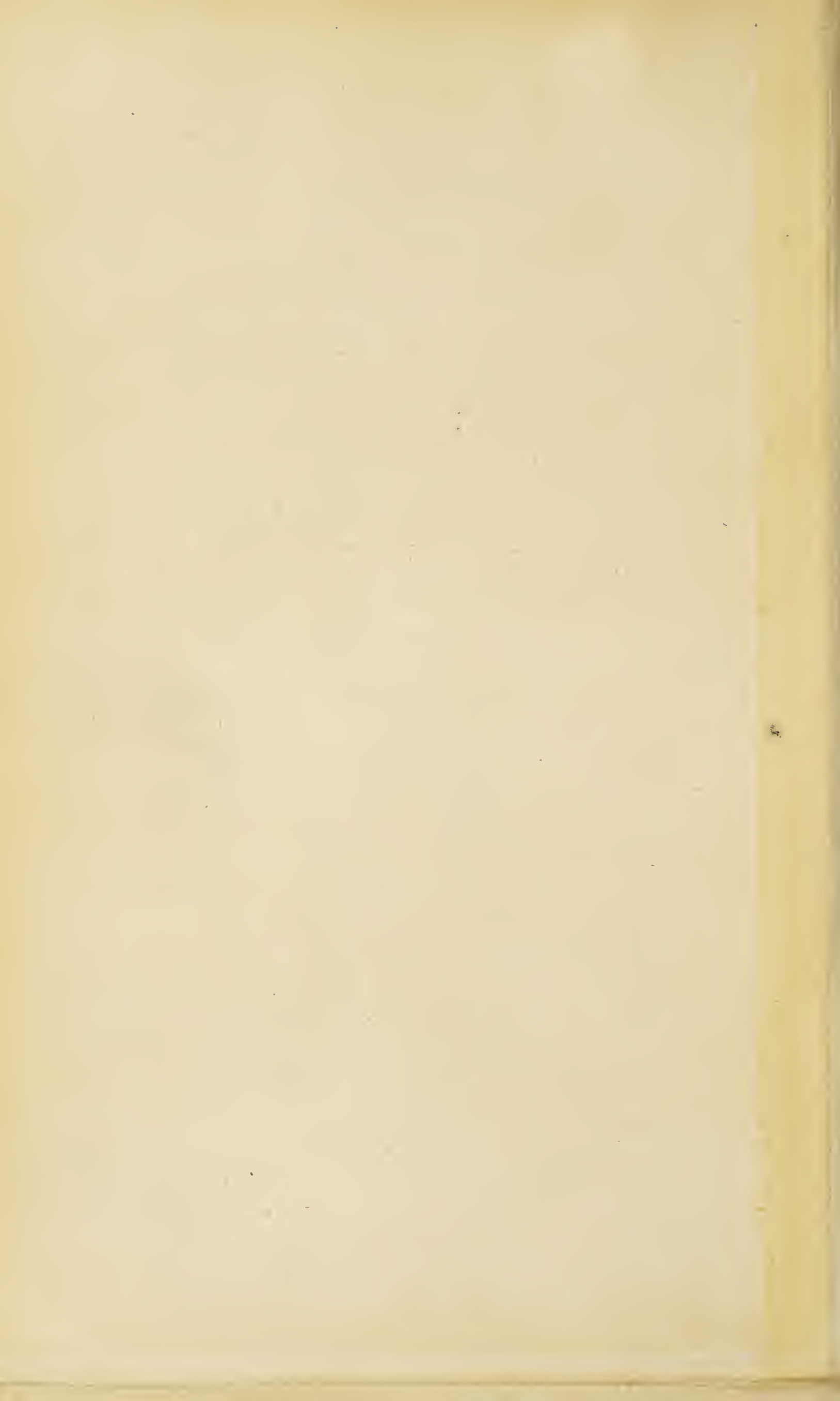


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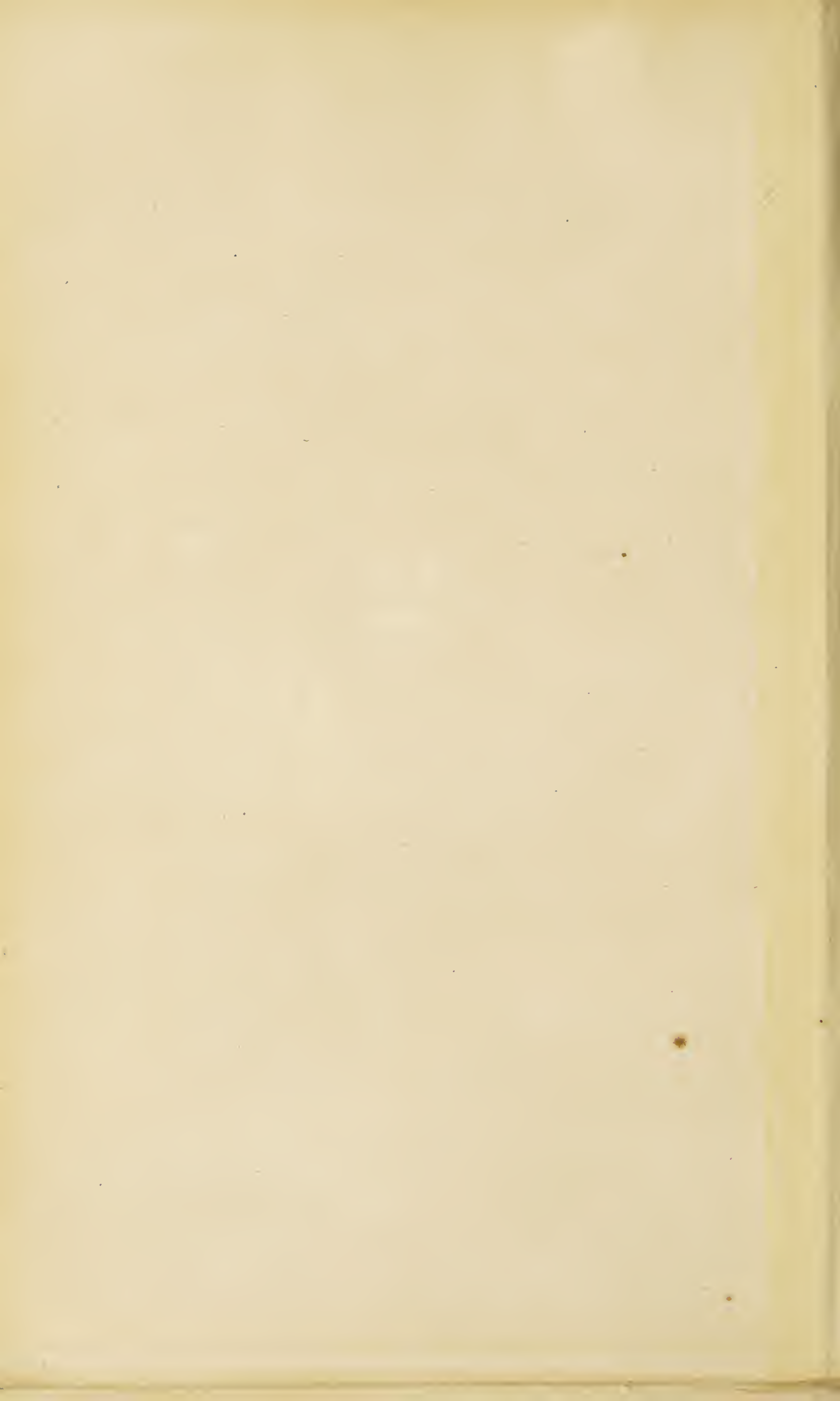




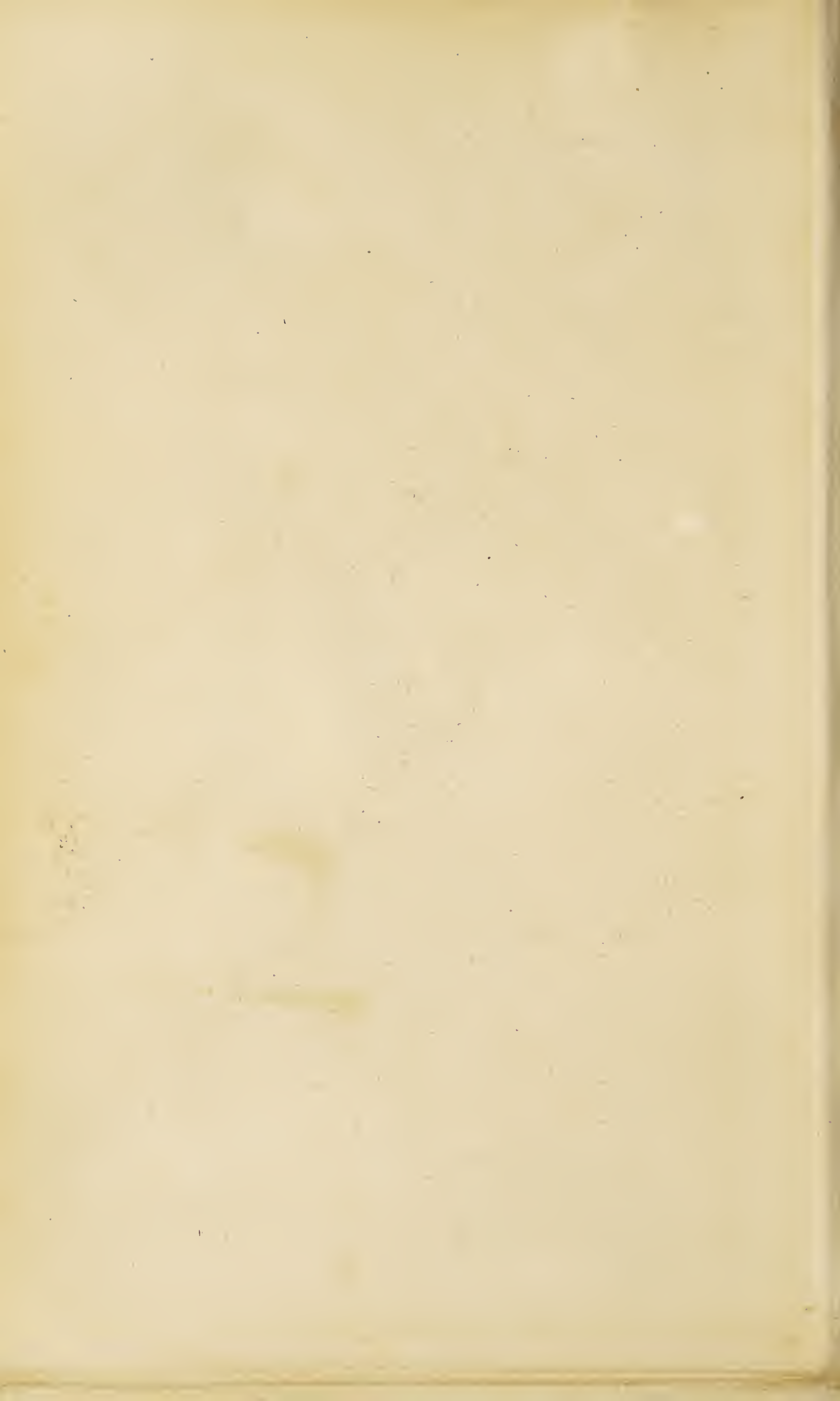




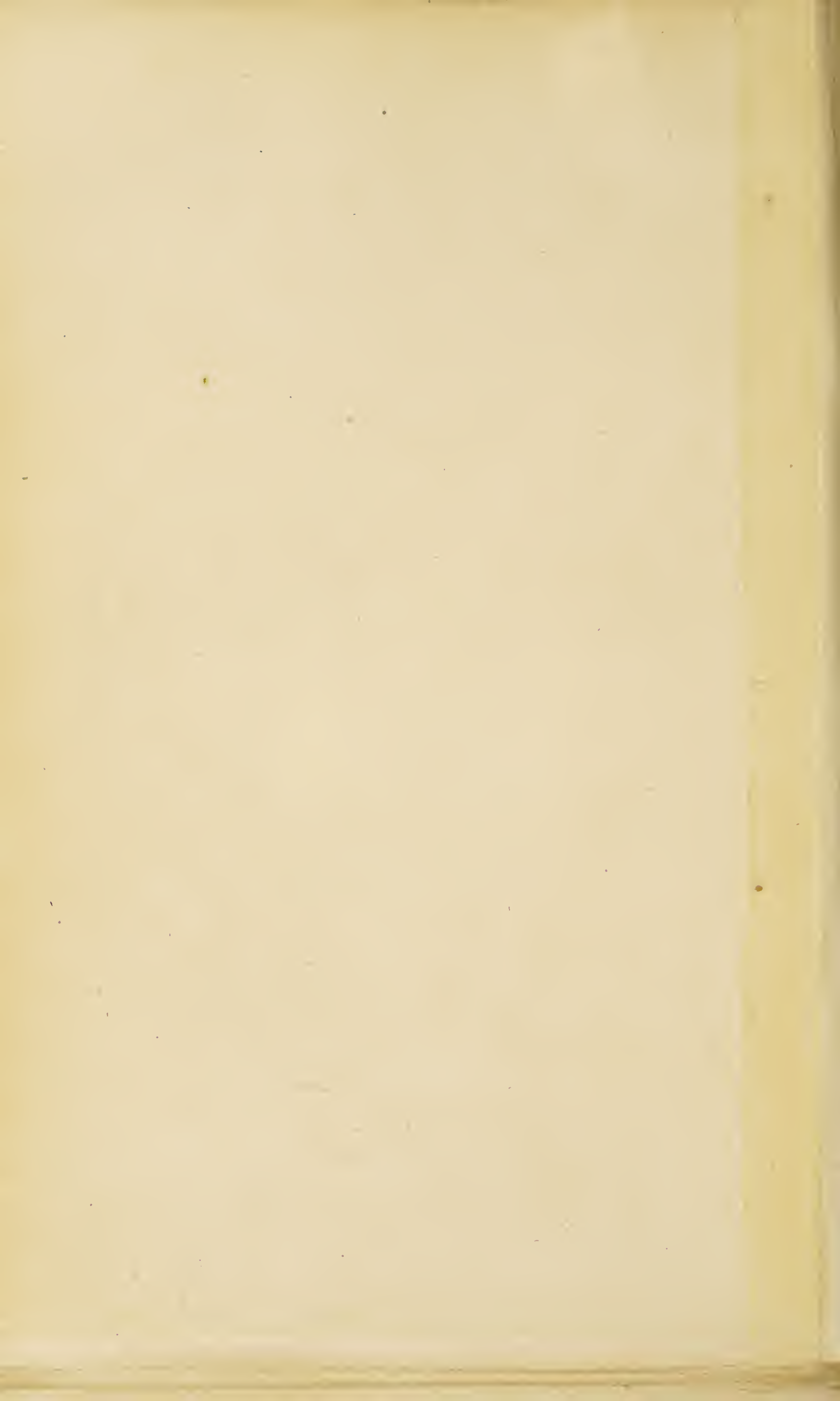




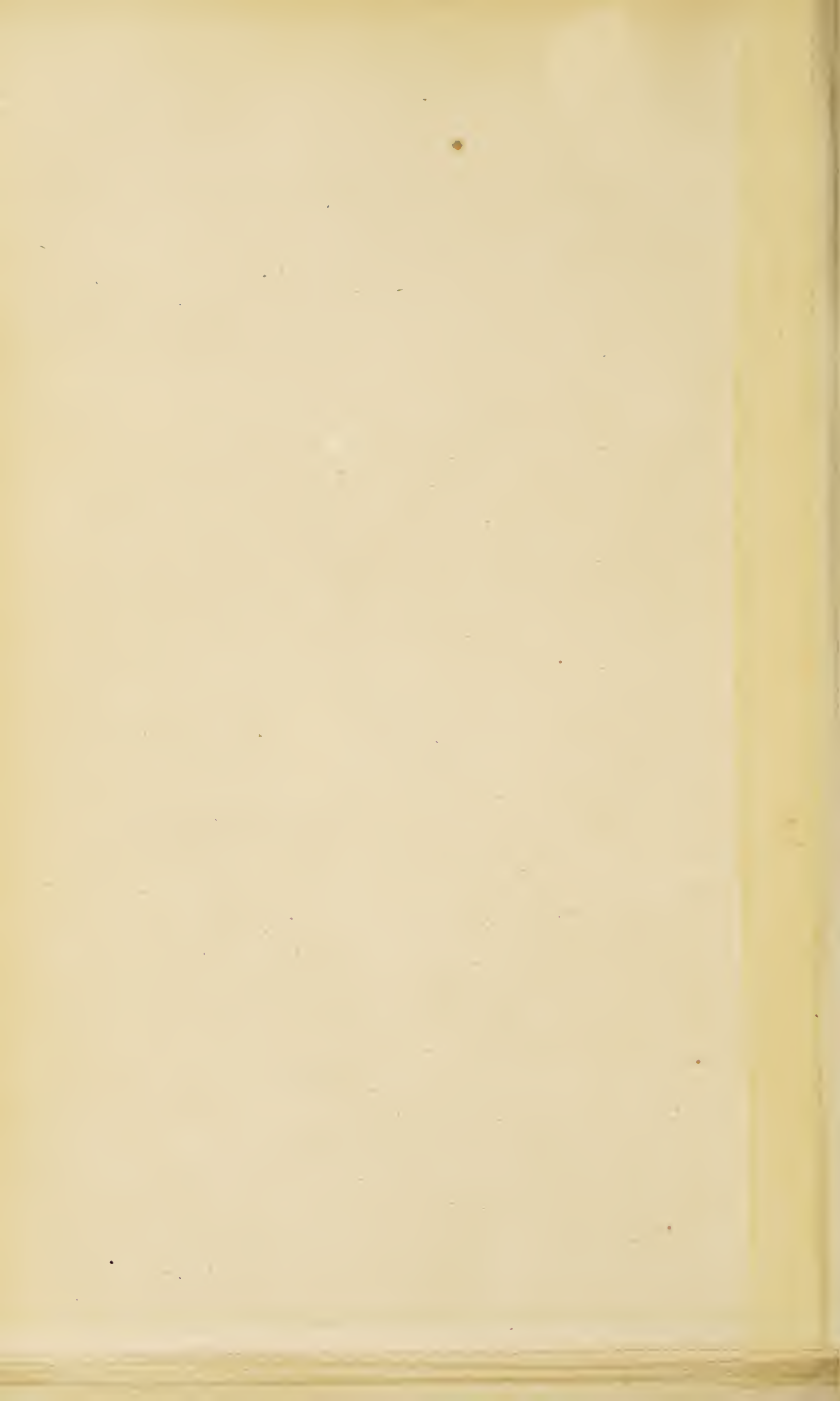




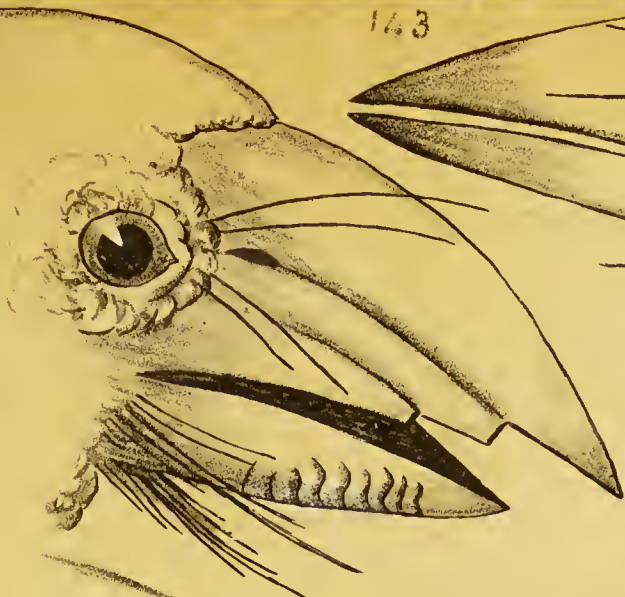




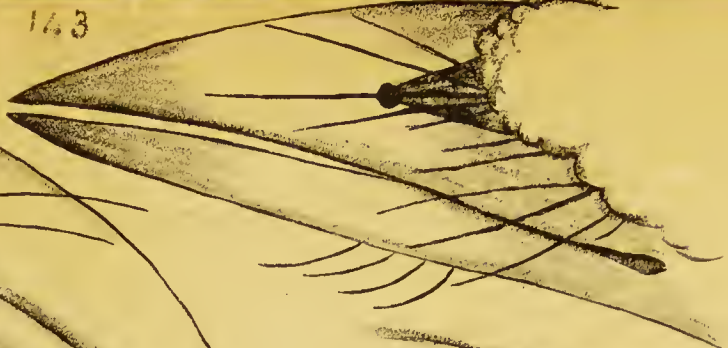




142



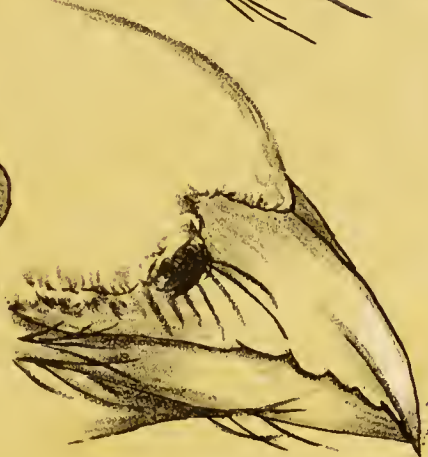
143



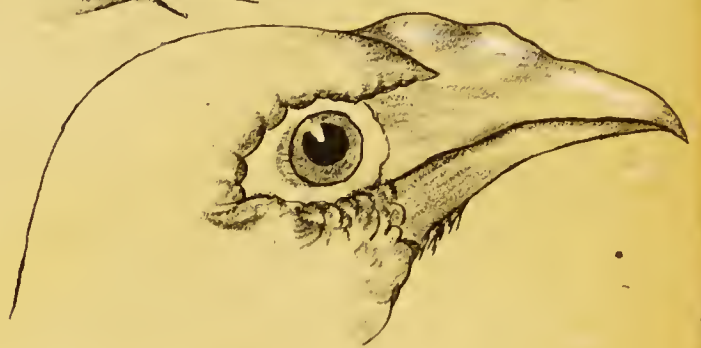
144



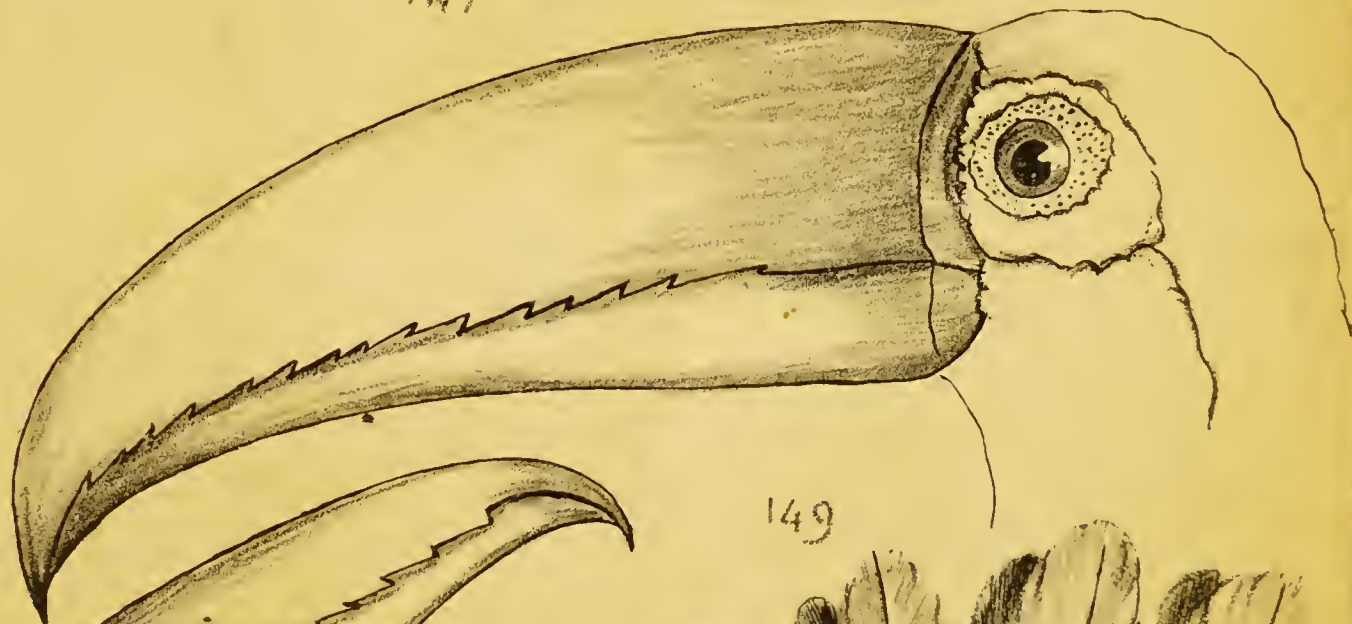
145



146



147



149



148



S Bowdich Lith:

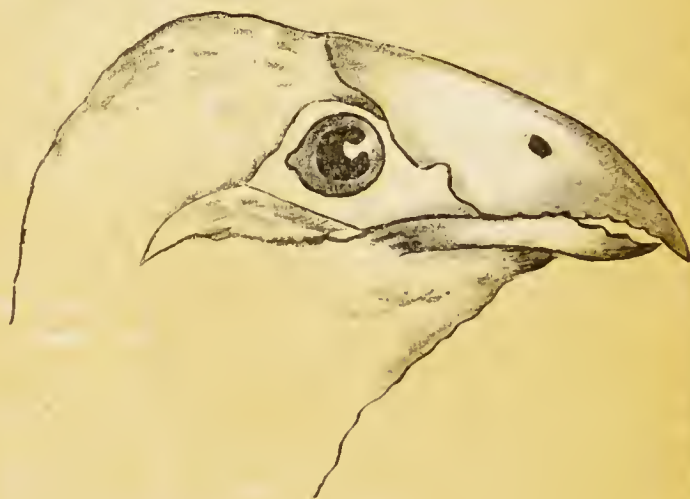
S Bowdich Lith:

150



150

152



151



153





175



176



176



177

178

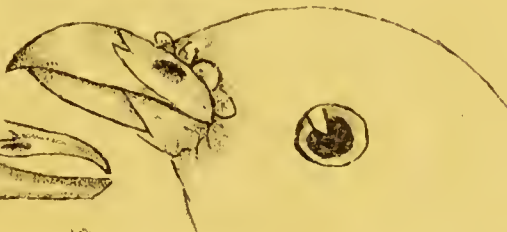


179

180



181



182

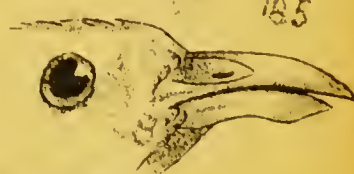


183

184



185

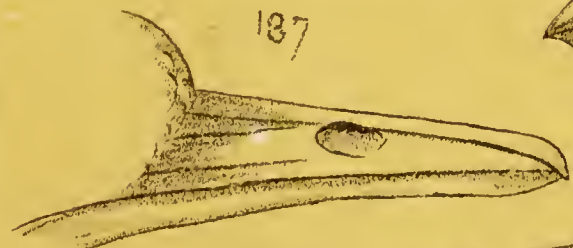


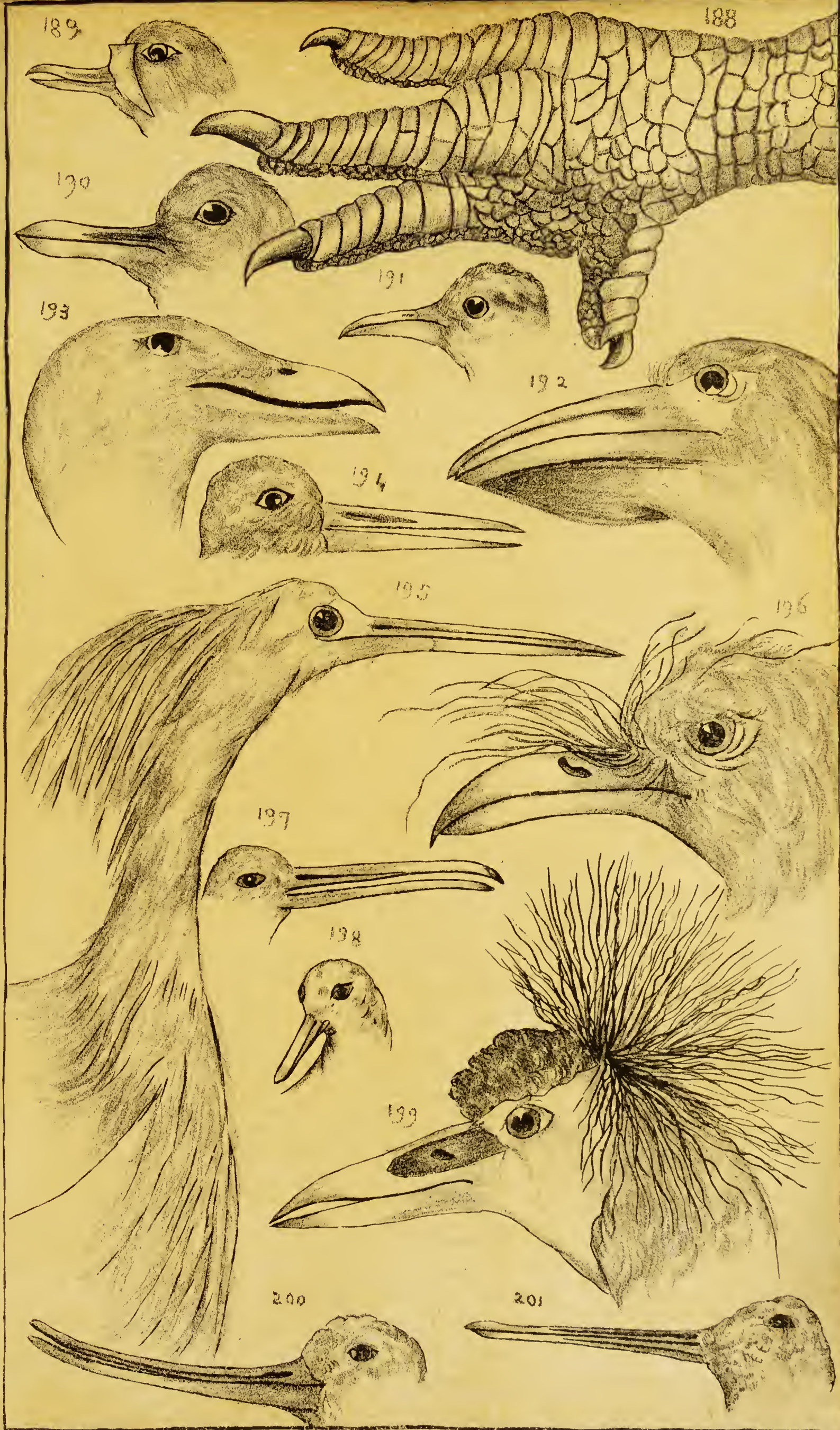
186



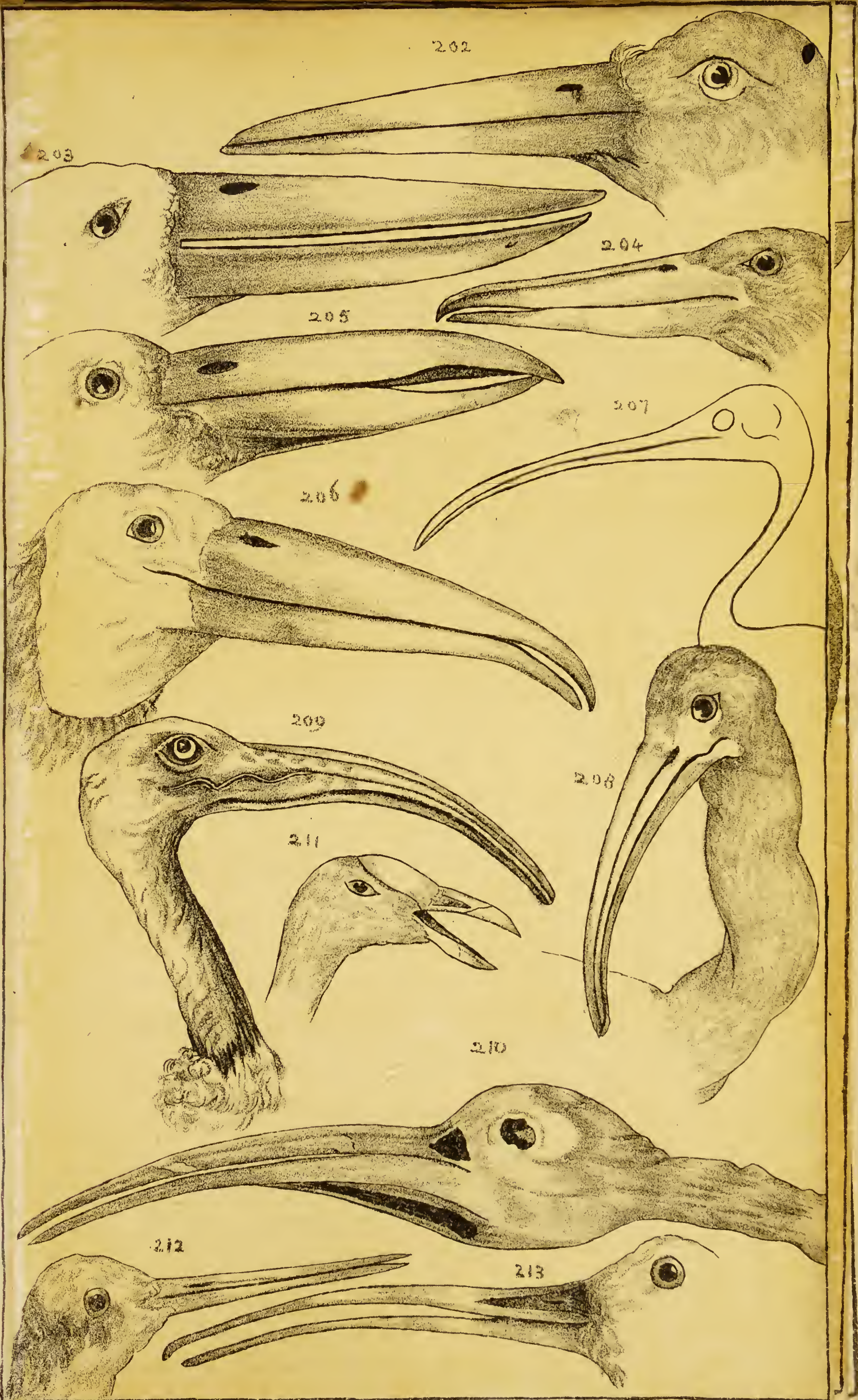
188

187





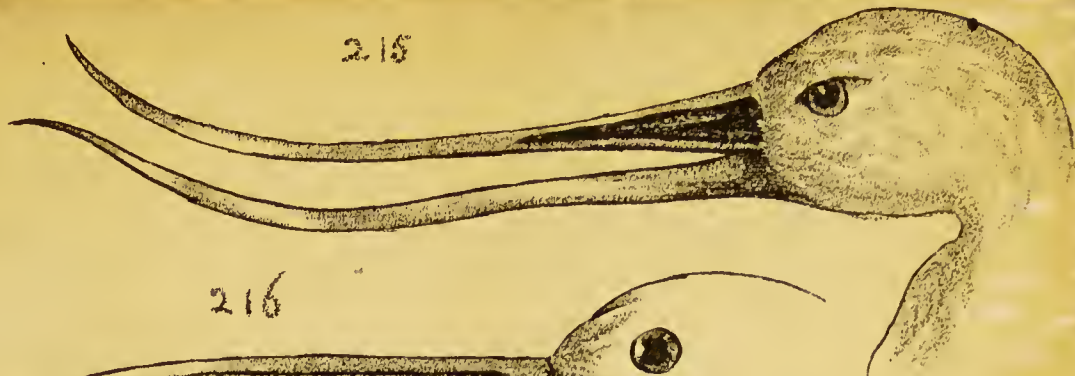




214



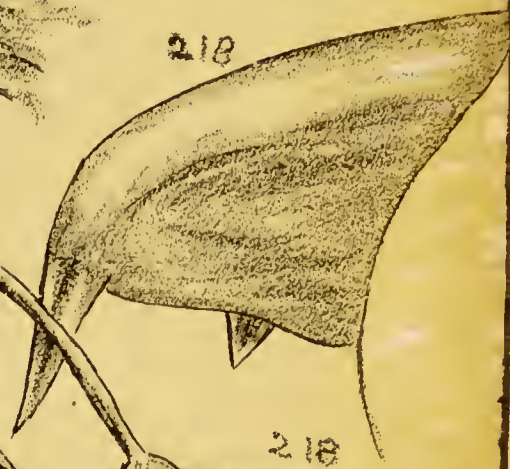
215



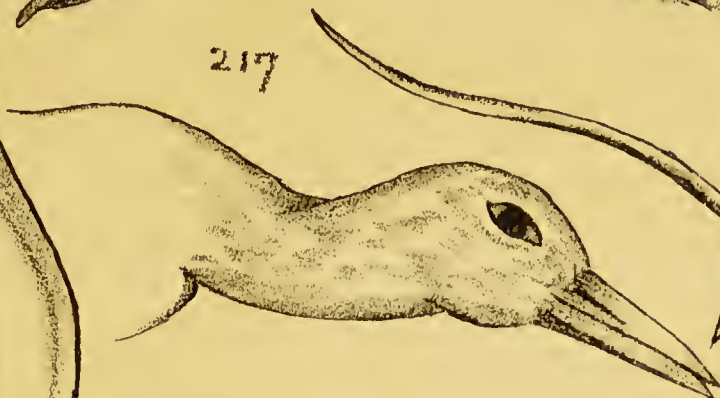
216



218



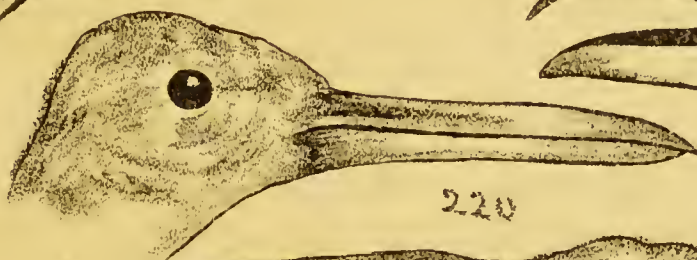
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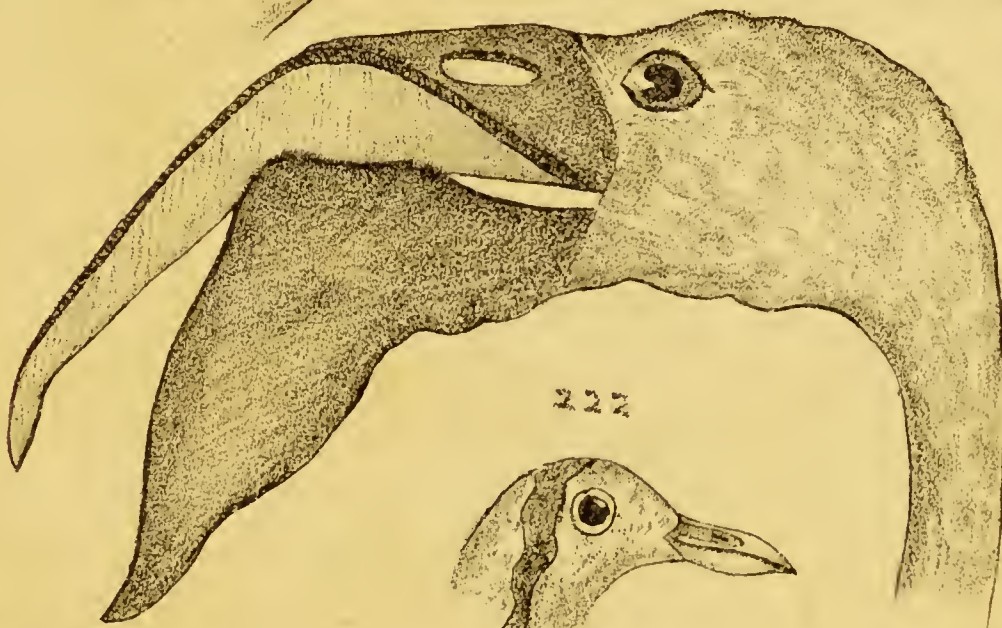
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221



223



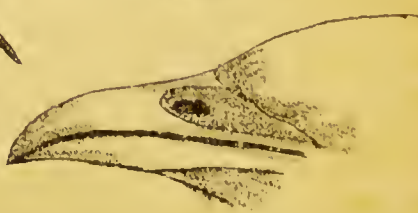
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225

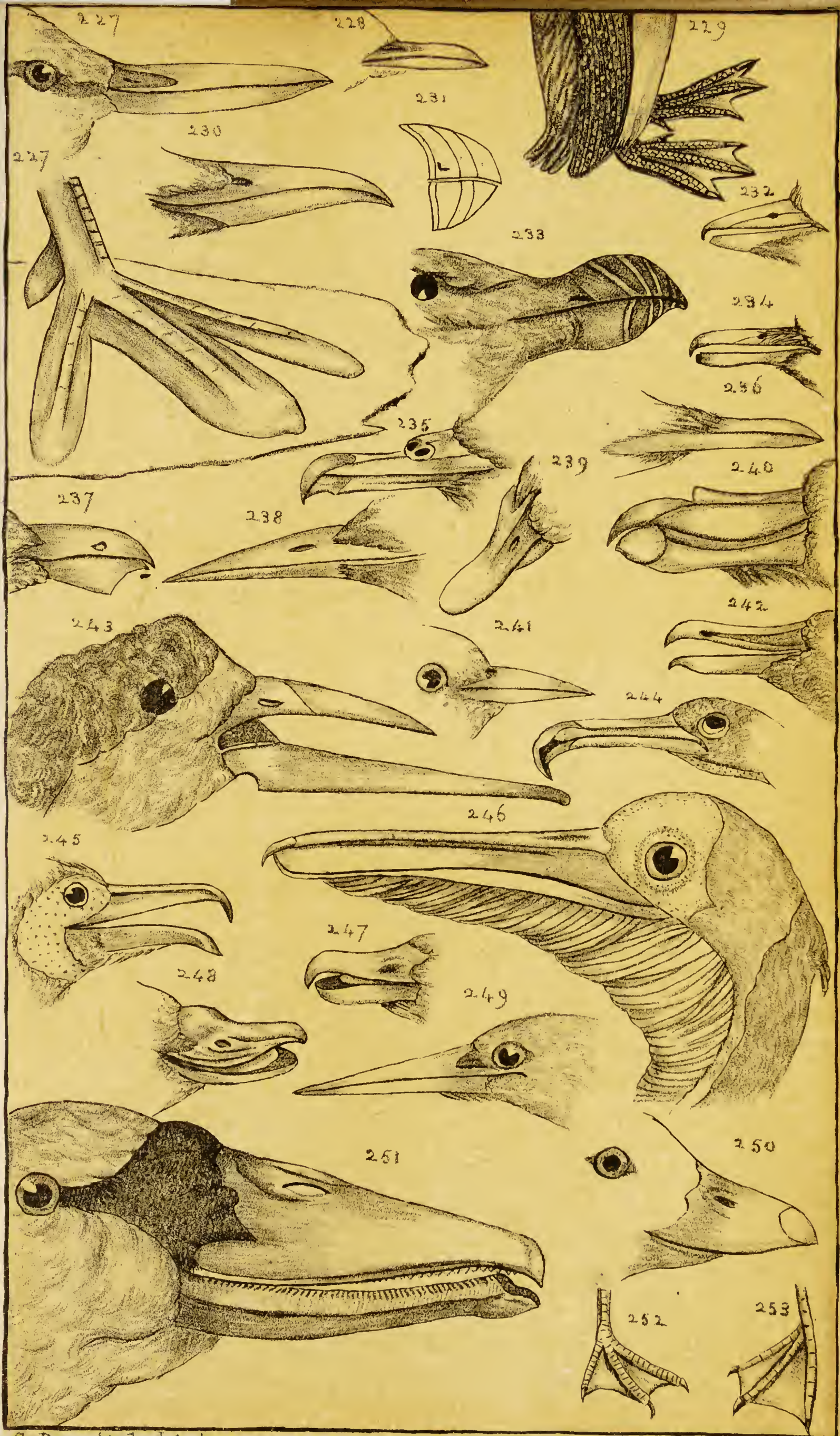


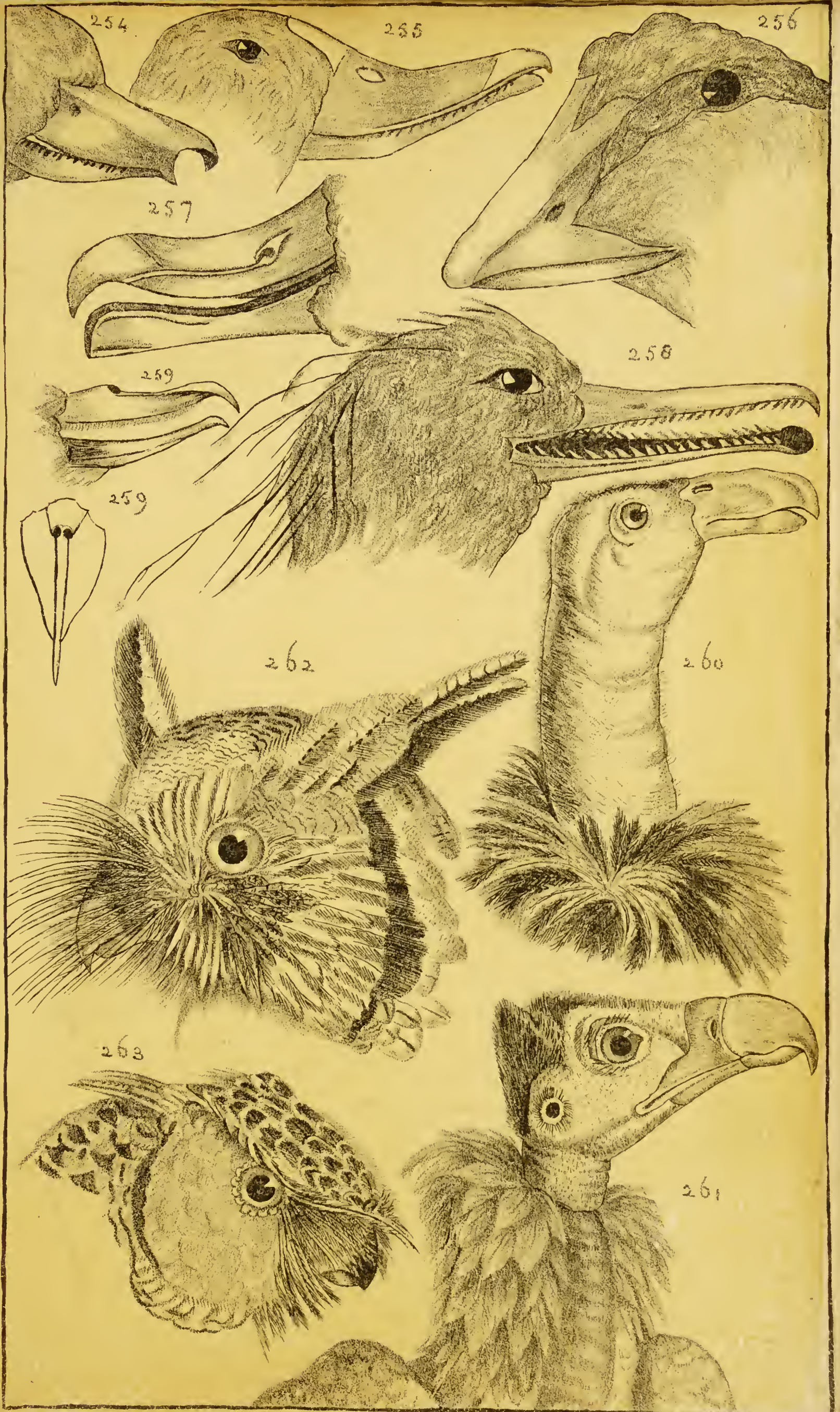
224



226









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15
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7/5

